Volume 89 Number 23

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

The Week In Steel

BELIEVE it or not, but there are some businesses which have maintained their sales volume and profits during two years of depression, and a few which actually have increased them. Sensing an extraordinary situation, the department of commerce undertook early in the fall to analyze the programs and experiences of these fortunate companies, to search out their secret. Among manifold reasons two stand pre-eminent—increased sales effort and generous advertising (page 17). Breaking down the item of sales effort, the department ascribes credit to market research, reduced prices, closer direction of salesmen, diversification, and as prime assistance in promoting economy in production it lists installation of modern equipment.

Open Throttle on Wages and Freight Rates

The moral of self-help which may be deduced from this survey apparently is being applied by the railroads to their own vexing problems. Galvanized into action on wages as well as freight rates, the railroads are proceeding with uncommon vigor to press for an early solution (page 19). Already they are before the interstate commerce commission to explain their pool for distributing revenue accruing from increased freight rates. Ceasing to pussyfoot on wages, the carriers have delivered a virtual ultimatum to organized labor to take a 10 per cent reduction voluntarily or be plunged into the morass of mediation. Labor's decision probably will be made at Chicago, Dec. 8.

Dollar Swells 18 Per Cent over 1923

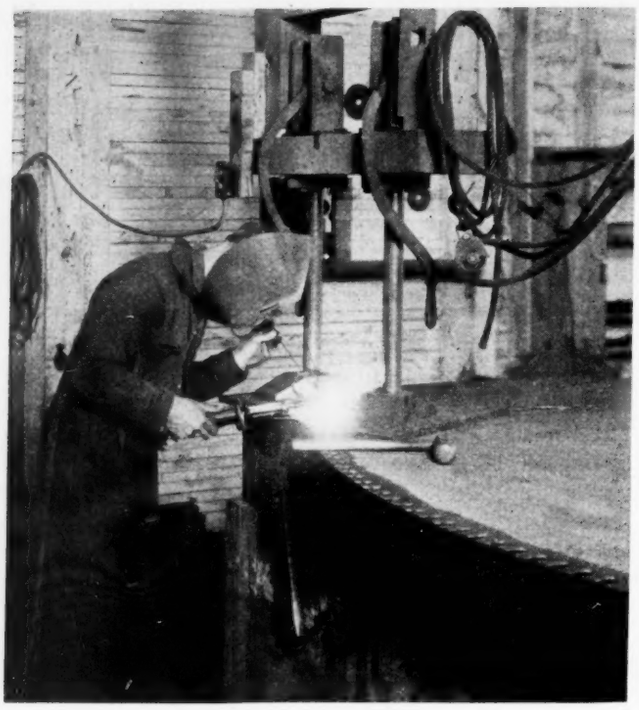
But the self-help motive of the railroads grants no license for self-pity to labor. . . . The cost of living, according to the department of labor's newest compilation (page 18), stood at 84.9 in October on the basis of the average for 1923 equaling 100. To put it another way, the dollar is 18 per cent larger today than eight years ago. . . . Even Stalin, dictator of soviet Russia, finds labor a difficult problem, his recent statement (page 25) relative to differing rates for differing tasks conceding the need for an incentive and the desirability of riveting labor's interest in its job.

Steel Staging an "Economic Retreat"

Something akin to the periodic "economic retreats" conducted by Stalin is occurring now in steel (page 43). Largely the sequel to the prodigious feats performed by Washington in stabilizing the credit and banking situation, sentiment has been looking up, production has

Wide World Photo

Like wings of a dragon fly, only stronger: These of the new all-steel airplane, shown on page 19, are wire cloth, coated with transparent "dope"



Until atomic hydrogen welding was devised, an inserted-tooth saw like this, costing $2500, once broken, generally was a total loss. This welder at Tacoma, Wash., is using General Electric equipment

expanded moderately. But in the past week steel's powers of recuperation have buckled under the weight of demoralized grain and security prices and a relapse to despondency.

Long Pull Outlook Better than Short

However, out of the collapse of its hopes for December steel has salvaged some confidence in the long pull. . . . Structural awards and inquiry are broader (page 48). . . . The Radio City contract (page 49) for reinforcing concrete bars is a record one. . . . A steel pipe line to carry grain from Montana to Chicago (page 43), still in the projected stage, promises a record in pipe. . . . On the debit side is an unsettled price situation (page 43), with shapes and plates definitely weaker, and numerous sporadic concessions for specific business. . . . This pressure on prices is reflected back to the open-hearth furnace, where today's problem (page 37) is to obtain the highest economy in the face of curtailed production.

No Free Wheeling, Yet, on Production

Automobile schedules are exceedingly sensitive to the general business situation, and the current easiness no doubt will curtail December output. Nevertheless, an output of over 100,000 units seems essential to stock dealers with new models. Ford steel, like that of other makers, has been issued in driblets but seems certain to expand (page 43). . . . The new Chevrolet, making its bow Dec. 5, will feature free wheeling and syncro-mesh transmission (page 24). . . . The manganese controversy is coasting along on free wheeling, Russia announcing a reduction in production (page 20) while South Dakota plans to develop its deposits.

From Sky to Ocean Bottom Is Steel's Range

Only the sky, literally, is the limit for speed, as was proved last week when the first all-steel airplane (page 19) made its maiden flight over Long Island. Stainless steel encloses the fuselage; thin wire cloth saturated with "dope," giving the appearance of mica, is the wing fabric. If this four-passenger amphibian is a mechanical success the choice of the name Pioneer may be auspicious for steel. . . . And the ocean bottom, within reasonable depths, is the other limit for steel. Treasure which sank with the LUSITANIA in Irish waters in 1915 will be salvaged if a sectional steel tube (page 18) terminating in an observation and air chamber can be lowered 240 feet to the decks of the torpedoed liner.

For Milk Pails or Liners, Alloys Have Merit

Were the LUSITANIA on the ways today a much larger proportion of alloy steel would enter into her construction. In the use of special steels offering high tensile strength and anticorrosive features the marine field has lagged, but the shipbuilder is now being offered steel (page 33) which reduces dead weight with no sacrifice of other desirable qualities. A new chromium-manganese-silicon steel has merit. . . . For the dairy machinery field a new nickel-base alloy low in iron, containing chromium and offering strength with high resistance to corrosion (page 33) is winning adherents, for one reason because it can be fabricated as easily as ordinary steels.

Motor Control Is Boon to Cold Rolling

Greater accuracy in cold rolling wide strip is being attained by the new four high, roller bearing mill (page 31), made possible by larger and improved motors and radical changes in control, necessitated by low threading speeds, high rolling speeds, tension between stands, smooth and simultaneous acceleration or deceleration, and adaptability for producing a wide range. . . . Free wheeling has been adapted to a four-high cold strip mill at an Ohio plant, the first stand of the mill being equipped with feed rolls chain driven from the spindle driving one of the work rolls (page 38). Once the work rolls grip the strip, the feed rolls become idlers.

Push Sales, Advertise—Govt. Elixir for Ailing Business

WASHINGTON — Increased effort and generous advertising policies—these are the reasons why some industrial and business firms have made material progress, during the depression, in maintaining or increasing sales volume or profits.

So the department of commerce, through its bureau of foreign and domestic commerce, reports after gathering 358 such examples, representing 202 manufacturing industries, 43 retail distributors and 10 wholesalers, in 74 cities in 30 states.

Summarizing the results of its survey, which the department qualifies as not being an exhaustive investigation but does exclude favorable demand caused by outside agencies, such as government stimulation of public improvements, the department states:

Increased sales efforts and advertising policies are the most important reasons given by firms for their success. Market research, reduced prices, improvement of service, management of salesmen and co-operation with dealers occupy a prominent position in the marketing programs of the companies.

Of scarcely less importance are the policies dealing with new products, quality, research, diversification and modification. In their production policies, firms have focused most of their attention on reduction of operating expenses and installation of modern equipment.

No Letup in Sales Drive

It is noteworthy that not one of the companies included in the study as having been successful in combating the effects of the depression has diminished its sales effort in order to save money. Sales costs have been studied more closely and sales efficiency increased, but the drive for sales volume has not lessened.

Out of 46 companies, representing 30 types of business including radio, electrical appliances and refrigerator manufacturers, 37 intensified their sales efforts, five increased their sales forces, four described their sales pressure as sustained.

More firms—total of 80—made statements concerning their advertising policies than on any other topic, "indicating the importance attached to the value of advertising by these successful companies," states the department of commerce. Thirty-three industries were represented, including machinery, refrigerators and heating equipment.

Twenty-nine of these firms reported an expansion in their advertising, 19 have maintained it, the remainder describe their efforts as aggressive or extensive or paying greater attention "to the purchase of space to secure proper and profitable return on expenditures."

To maintain payrolls one successful company painted the machines, equipment and inside of its plant, using bright colors, and where moving machinery was concerned, contrasting colors. The benefit in improved morale, elimination of eye strain, fatigue and nervous tension, enhancement of employes' pride in cleanliness and carefulness turned this program into a genuinely profitable venture.

Markets Under Microscope

An aluminum and brass manufacturer, seeking diversification, found it helpful to equip to handle nonferrous metals for architectural purposes. A piston ring company equipped its salesmen with motion picture outfits, which contributed to a 34 per cent increase in profit in the first half of 1931.

Policies playing a major role in maintaining or improving business in addition to advertising and including breakup of increased sales effort, include: Market research, new uses of product, management of salesmen, analysis of sales costs, expansion of foreign lines, improving service, extending credit, and reduction of prices.

Under the heading "production" the department of commerce unearths these helps: More careful purchasing, installation of modern equipment, reduction of operating expense, reduction of overhead, and balanced production.

Germany Grants Patent on Continuous Sheet Mill

Middletown, O.—American Rolling Mill Co. has been granted a German patent on its continuous sheet mill development.

The German patent office procedure differs from that of the United States office in that before patents are granted they are made public to invite opposition from interested parties.

In this way, examiners of the patent office are informed of processes and shop practices which have not appeared in technical or patent literature. To fulfill requirements, a German patent must be new and a distinct contribution.

Wants Antitrust Laws To Stimulate Small Business

The small business man and independent manufacturer still is the backbone of American industry; the antitrust laws should be revised to permit a wider field of co-operation for the small business man in production and distribution, declared Benjamin Schwartz, director general, Institute of Scrap Iron and Steel, addressing the

A TEMPLE OF COMMERCE: Said to be one of the largest office buildings in the world, this new home of the department of commerce in Washington will house every activity of the department except the bureau of standards, early in 1932. *This 7-story building has a basement and sub-basement, is* 1050 *feet long,* 325 *feet wide, has* 1,605,066 *square feet of floor space, boasts* 3311 *rooms,* 15 *entrances,* 36 *elevators, an auditorium seating* 1000. *It required* 16,400 *tons of structural steel* 10,000,000 *common brick,* 1,500,000 *face brick,* 2000 *cars of limestone*

Rhode Island Purchasing Agents association at Providence, R. I. Other views of Mr. Schwartz:

Trade associations should be strengthened to give independent manufacturers the same benefits as large, consolidated interests.

New automobile prices should be increased $25, giving steel a living price and creating a fund for scrapping cars, thereby broadening the new car market.

Living Cost Reduced Less Than 1 Per Cent in October

Slight decreases in the cost of food, clothing, rents and several sundries resulted in a decline of 0.8 per cent in cost of living between September and October, according to the National Industrial Conference board, New York. The index number for October was 84.9, with the average for 1923 as 100. The purchasing value of the dollar was 117.8 cents in October, as compared with 100 cents in 1923.

Wide World Photo

STEEL TUBE TO PENETRATE TO LUSITANIA'S TREASURE CHEST: This is the first section, completed recently in England according to the plans of Simon Lake, submarine designer. Another section will be added; the complete tube to be lowered from a ship to a depth of 240 feet to where the great liner, torpedoed by the Germans in 1915, lies off the head of Old Kinsale, Ireland. Divers will descend through the tube to the observation chamber, from which powerful searchlights will illuminate the wreck; and from this vantage point it is hoped they will be able to explore the ship, known to hold a large amount of gold and many valuable articles

What's Happening In Business World

FROM London, Ont., it is reported that the London Structural Steel Co. has cancelled an order for 50 tons of structurals with an American fabricator and has placed it more cheaply in Britain because of the discount on Canadian money.

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A new market for pipe? South Shore Heating Co., Islip (Long Island), N. Y., would lay a pipe line system in Islip, Bay Shore and Sayville to distribute fuel oil to domestic consumers.

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Gulf States Steel Co. is praised by the Gadsden, Ala., chamber of commerce as being the first steel company to provide its own airport. The airport, paid for entirely by the company, will be dedicated Dec. 10 and called "Gulfsteel Airport of Gadsden."

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Under the will of Richard T. Crane Jr., late president of Crane Co., Chicago, employes will receive one share of Crane common stock for each year of service up to 25 years, two shares for each year over 25. Employes who have sold previous gift stock will receive only half of their allotment.

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General Electric Co. realizes about $16,000 a year by salvaging metals from ashes produced in the scrap incinerator at its Schenectady, N. Y., plant. Each month about 100,000 pounds of ashes are pulverized in a ball mill, larger pieces of metal being separated by a magnet. The finer material passes over a hydraulic concentrating table, which reclaims the lighter metal particles.

Business Is Better

REPORTS on business conditions from 150 Crane Co. branches in every state in November disclose marked improvement over October, according to J. B. Berryman, new Crane president.

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Colorado Fuel & Iron Co. is reopening several mills Dec. 1 to provide pay days for as many employes as possible before Christmas.

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Union Pacific railroad is returning 3500 employes to work through reopening of car and locomotive repair shops at six cities closed since Oct. 17.

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Borg-Warner Corp., Chicago, reports increased business in automotive parts due to scheduling of new models.

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Bendix Aviation Corp., South Bend, Ind., has booked more business in brakes, carburetors, drives and other of its products in the past 90 days than in any previous full year in its history.

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Timken Roller Bearing Co., Canton, O., has put on a 100-ton open-hearth furnace; Follansbee Bros. have returned 700 men at Follansbee, W. Va.; Wheeling Steel Corp. has added 500 men at various mills; Republic Steel Corp. is relining five open hearths at Youngstown which have been idle more than a year.

Extends Pattern Standard

Washington—Department of commerce commercial standard on foundry patterns of wood has been reaffirmed for another year, without change, beginning Feb. 2, 1932.

Steel Wage Averages Raised, Prior to Reduction

Average hourly wages at blast furnaces and bessemer converters in March this year showed an increase over March, 1929, according to the latest biennial survey by the bureau of labor statistics. The rate for blast furnaces was 55.1 cents this year, and 52.8 in 1929; and at bessemer converters, 66.4 cents compared with 64.3. A slight reduction is shown for open-hearth furnaces, at which the rate on March 31 was 70.3 cents, against 71.4 cents last year.

A 10 per cent reduction in the March, 1931, rates would bring the average hourly wage at blast furnaces to 49.6 cents, lowest since 1922, when it was 39.8 cents. The average at bessemer converters would be 59.7 cents. In 1922 it was 47 cents. A similar reduction at open-hearth furnaces would bring the rate to 63.3 cents, as compared with 48 cents in 1922. Some reductions between March and Oct. 1, when iron and

steel wage rates were cut 10 per cent, may have brought the actual averages slightly lower.

Average weekly earnings in both blast furnaces and open-hearth furnaces were lower in March, 1931, than in 1929, while in bessemer converters they were higher. For blast furnaces this year they were $31.52; bessemer converters, $35.29; and for open-hearth furnaces, $37.82.

Reductions were made in average full-time hours per week in all three departments; in blast furnaces, from 60.7 to 57.2; in bessemer converters, from 53.7 to 53.3; and in open-hearth furnaces, from 57.7 to 53.8.

Declared First Skyscraper

Chicago—Home Insurance building, recently razed, has been declared, by a jury of construction men and architects, to have been the first skyscraper. Its claims over the Tacoma building, erected three years later than the Home Life, are sustained on the ground its structural steel work carried all floor loads, while the Tacoma building had transverse masonry walls which carried part of the floor load.

Expands in Fluorspar

Cleveland—Oglebay, Norton & Co., representing fluorspar shippers in Illinois, have expanded their activities to include additional shippers in Illinois and a number in Kentucky.

Roads Move on Rates, Wages; Washington Business News

WASHINGTON — the railroads, apparently determined to move with expedition toward a solution of their chief problems—freight rates and wage rates—are acting this week with the interstate commerce commission on rates, expect next week to have the wage situation clarified.

Hearings on the railroads' proposal to set up the Railroad Credit Corp. to effect distribution of the revenue accruing from the increase in freight rates sanctioned by the commission opened Nov. 28 before the commission.

Only one serious point of difference exists between the railroads and the commission. The stronger lines naturally will benefit most from the increases; the weaker lines, most in need of assistance, will benefit least. To sanction the railroads' proposal to distribute added earnings as a loan would require a change of front by the commission. But the need of the carriers is so urgent that a speedy solution is visualized.

The status of the wage matters, briefly, is this: Leaders of organized railroad employes have refused to make a voluntary 10 per cent reduction without assurances which, from the railroad viewpoint, would vitiate any expected economies. The railroads, therefore, have put it squarely up to labor to make a final decision at a meeting at Chicago, Dec. 8, when there will be a greater representation of railroad labor.

The inference is that, if labor does not take a 10 per cent cut promptly, the carriers will immediately initiate the mediation proceedings set up in the Transportation act. The minimum time for a decision would be 130 days, or about April, with a possible prolongation for seven or eight months.

New class rates become effective in eastern territory Dec. 3, and it will be on top of these new rates that the commission's recent authority to increase rates will be superimposed. The New York commission has authorized the new class rates on intrastate rates; the New Jersey commission has suspended them. Western roads have petitioned for a reopening of the proceeding affecting their class rates.

One effect of the revised class rates, which would mildly improve railroad earnings, will be to shut eastern mills out of Milwaukee. From Pittsburgh to Milwaukee the new rate on finished steel, for example, will be 36 cents per 100 pounds while the rate from Chicago stands at 8½ cents.

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Almost daily definite word is expected from London that the English government's antidumping duties will include one of 33 1/3 per cent on all iron and steel products. In a normal year Britain imports about $125,000,000 worth. This duty would remain for about five months or until a permanent tariff policy is laid down.

The 50 per cent ad valorem antidumping duties thus far imposed affect manufactured goods only, such as typewriters, vacuum cleaners, metal furniture, hand tools and similar lines.

Apparently, Britain has studiously avoided raising duties on any products which would permit the American government to impose countervailing duties.

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Representatives of machine tool builders have conferred with Secretary of Commerce Lamont on the Russian situation. Banks are understood to be refusing long-time Russian paper, raising another barrier to trade.

Manufacturers also are opposed to American foreign loans, or any amelioration of the foreign war debt situation, being used by the benefiting European nations to expand their credits to Russia.

Soviet orders placed here recently are understood to have been made in some cases without any down pay-

International News Photo

FIRST ALL-STEEL AIRPLANE MAKES SUCCESSFUL FLIGHT: Corrosion-resisting sheets enclose the body, while wing frames are covered with a steel fabric, coated with a special "dope" which gives them the appearance of mica. The Pioneer, as it is called, was developed by metallurgists of the Edward G. Budd Mfg. Co., Philadelphia, and recently christened at the Port Washington, L. I., factory of the American Aeronautical Corp. It is an amphibian, carrying four passengers

ment, first payment to be made in 18 months.

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Production and employment in manufacturing industries declined further in October, while the output of minerals increased more than is usual at this season, says the federal reserve board in its monthly report on business and manufacturing conditions.

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President Hoover has announced appointment of Robert Lincoln O'Brien, Boston, as chairman of the United States tariff commission to succeed Henry P. Fletcher, whose resignation took effect Nov. 30.

Mr. O'Brien until 1928 was editor and publisher of the *Boston Herald* and at one time was a Washington newspaper correspondent. While President Cleveland was in the White House Mr. O'Brien was his personal stenographer.

Manganese—Soviet Cuts Output, Dakota Starts

Manganese continues a troublesome issue.

Scarcely has the American Manganese Producers' association announced it will submit to congress evidence of Russian dumping and Senator Oddie and Representative Williamson stated they will introduce bills to embargo the Russian product, than soviet trade authorities set out to restrict production.

As relayed by the American legation at Riga, planned output for the calendar year 1931 is 963,000 metric tons. This is 40 per cent under 1930. In 9 months of 1931 the United States imported ore with a manganese content of 206,752 tons, against 223,011 tons in 9 months of 1930; these imports are excluding receipts from Cuba and are chiefly Russian.

Evidently encouraged by the fight against foreign manganese, an effort to commercialize deposits along the Missouri river near Chamberlain, S. Dak., is announced by Prof. E. Prosper McCarthy, formerly of the University of Minnesota, now consulting engineer for the General Manganese Corp., Detroit.

It is claimed there are 55,000 acres of shale bearing 60 pounds of manganese and 30 pounds of iron to the cubic yard. The bed of shale in which the manganese is found is said to be 37 feet deep, a marine deposit, with cost of extracting the ore figured by the promoters at $2 a ton.

October Auto Output Nears Ten-Year Low

Automobile production not only showed the greatest percentage decline for any month of 1930 but at 80,142 assemblies preliminarily reported for October dropped through the low mark of almost ten years, back to December, 1921. The drop was largely confined to passenger cars, according to the department of commerce. The Canadian total, at only 1440 units, is by the Dominion bureau of statistics:

	—United States—			Canada
1930	Total	Passenger cars	Trucks	Total
Sept.	220,649	177,752	41,967	7,957
Oct.	154,401	115,476	38,343	4,541
10 mos.	3,063,531	2,554,444	502,185	143,163
Nov.	135,754	102,358	33,787	5,407
Dec.	155,701	122,748	31,528	5,622
Year	3,355,986	2,805,516	541,534	154,192
1931				
Jan.	171,851	137,805	33,534	6,496
Feb.	219,939	179,890	39,520	9,871
Mar.	276,341	230,835	45,096	12,993
April	336,939	286,252	50,022	17,159
May	317,163	271,135	45,688	12,739
June	250,657	208,955	41,342	6,835
July	218,961	182,927	35,854	4,220
Aug.	187,197	155,321	31,772	4,544
Sept.	140,566	109,087	31,338	2,646
Oct.*	80,142	57,764	21,727	1,440
10 mos.	2,199,330	1,822,117	373,321	78,942

*Preliminary.

Chicago Pushes Building

Chicago — Construction Investment Trust, organized to stimulate building, is functioning. Its capital is 1,000,000 $50 shares; union labor, employers and manufacturers have pledged for this sum. Applications are in for loans totaling $30,000,000; projects costing $17,000,000 have been examined, and 90 per cent found sound. In a week the trust expects to be putting out cash for construction of residences and industrial structures. Oscar Rosenthal, head of Builders' Association of Chicago, is president of the trust.

Every one of the 160 *rooms in this* 18-*story community hotel, built recently in Seattle, is on a corner, so arranged an occupant of one room cannot see into another window. An adaptation of the circular apartment type, developed in Germany, it is said to be the first building of its kind erected in the United States. Into its construction went* 400 *tons of reinforcing bars*

Steel Plate Orders React; October Low for 1931

After September's rise in booking of fabricated steel plates, October declined to a low for 1931. The drop was chiefly in material for oil storage tanks, gas holders and in the miscellaneous classification. Ten months of 1931 lag considerably behind 1930, according to 51 makers' report to the department of commerce:

In Tons

1930	Total	Oil storage tanks	Blast furnaces	Miscellaneous
Oct.	30,197	4,518	231	18,665
10 mo.	409,497	100,371	10,043	186,646
Nov.	33,151	9,965	179	14,632
Dec.	26,787	5,118	135	13,227
Year	469,435	115,454	10,357	214,505
1931				
Jan.	27,518	2,598	111	20,845
Feb.	24,438	3,585	75	16,245
Mar.	31,056	2,538	833	21,697
April	29,916	7,749	25	17,783
May	26,210	2,411	230	20,370
June	22,806	4,679	356	15,817
July	27,261	4,136	51	18,785
Aug.	24,282	1,138	125	18,331
Sept.	33,473	4,024	254	18,692
Oct.	20,664	1,955	200	16,331
10 mo.	267,624	34,813	2,260	184,896

Sheet Output Up Slightly In October; Sales Lower

Sheet production reported by the National Association of Flat Rolled Steel Manufacturers, Cleveland, averaged 3959 net tons daily in October, an increase of 1.6 per cent over September. Shipments averaged 4173 tons, a gain of 1.4 per cent. Sales, at 3780 tons, showed a loss of 6 per cent. Total output for the month was 122,739 tons; shipments, 129,365 tons; and sales, 117,195 tons.

Unfilled tonnage Nov. 1 was 159,367 tons, compared with 167,366 tons Oct. 1; and approximate finished stock on hand awaiting shipment, 66,778 tons compared with 75,816 tons. Total sheet capacity in the United States for October was approximately 548,000 tons, and the capacity on which the foregoing figures are based was 370,400 tons.

Geometric Stamping Co., Cleveland, this week is recalling 150 men, more than doubling its working force.

October Steel Exports Low; Imports Also Decline

EXPORTS of iron and steel products totaled 59,335 gross tons and imports 29,401 tons in October—the former thus recording a drop of 10,433 tons when compared with September and the latter a reduction of 1565 tons, according to the iron and steel division, department of commerce.

Decline in exports was the result of curtailed shipments in 27 of the 46 classes of products comprising this trade. With two exceptions the 19 increases registered were in small amount—the 3512-ton gain in scrap and that of 1653 tons in steel bars alone being noteworthy. Among the instances of reduced shipments were those in plain structural shapes, 5915 tons; and welded black and galvanized steel pipe, 3137 tons. Pig iron shipments were off 212 tons; ingots and blooms, 837 tons; wire rods, 1054 tons; rails, 688 tons; and forgings, 197 tons.

Exports of iron and steel products to Europe, the Far East and to Africa were greater in October than they had been in September and in each instance exceeded the proportion of total exports which have moved to each of these divisions over the elapsed ten months of the current year.

Trade with Canada, as usual the largest single outlet for steel products, declined sharply to 16,522 tons. Japan, the month's second market, with a total of 15,137 tons, just fell short of the first position.

Imports of iron and steel products during October were less than in September as the result of reduced shipments in 16 classes of products, gains in 15 classes being insufficient to offset this loss. Most of these changes were in small amount. Belgium continued in her role of chief supplier, being accredited with 12,608 tons of the 29,401-ton total.

IMPORTS AND EXPORTS
Gross Tons

	——1931——		——1930——	
	Imports	Exports	Imports	Exports
Jan.	40,781	92,745	43,624	223,766
Feb.	28,045	91,212	43,326	197,225
March	40,401	109,512	56,618	238,329
April	47,872	101,081	53,686	208,604
May	37,176	91,407	54,315	195,425
June	37,819	75,585	48,953	159,273
July	37,190	84,466	39,083	131,580
Aug.	30,139	73,338	35,405	150,922
Sept.	30,966	69,768	40,285	131,045
Oct.	29,401	59,335	38,344	131,845
10 mo.	359,790	778,681	453,639	1,768,014
Nov.	.....	.....	43,098	111,979
Dec.	.....	.....	40,754	101,992
Total	.....	.....	537,491	1,981,985

ORIGIN OF OCTOBER IMPORTS
Gross Tons

	Steel ingots, blooms	Steel scrap	Cast iron pipe	Steel bars
Austria	.....	.....	.....	29
Belgium	648	.....	.....	3,759
Canada	.....	1,041	.....	3
Czechoslov.	.....	.....	.....	13
France	81	.....	125	452
Germany	16	.....	.....	751
Panama	.....	.....	.....	89
Sweden	4	.....	.....	223
Unit. King.	1	.....	.....	25
Total	750	1,041	125	5,314

IMPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Item	Oct., 1931	Sept., 1931	Oct., 1930
Pig iron	4,413	5,104	13,552
Sponge iron	.....	1	10
Ferromanganese, spiegeleisen(1)	873	976	2,247
Ferrochrome (2)	.....	.....	.....
Ferrosilicon (3)	23	22	74
Scrap	1,041	746	4,336
Ingots, blooms	750	1,661	2,264
Concrete bars	3,411	3,571	541
Hollow bar, drill steel	117	127	139
Merch. steel bars	5,344	4,676	1,713
Iron slabs	.....	.....	.....
Iron bars	18	30	109
Wire rods	250	593	496
Boiler, other plate	2	1	.....
Sheets, skelp	440	1,852	2,083
Tin plate	2	34	23
Structural shapes	6,416	5,266	4,615
Sheet piling	338	2	266
Rails, fastenings	198	303	391
Cast pipe, fittings	125	236	364
Welded pipe	290	888	252
Other pipe	445	223	822
Barbed wire	513	404	428
Round wire	140	138	158
Flat wire, strip	64	74	47
Wire rope	197	177	196
Other wire	42	21	32
Hoops and bands	3,106	2,857	2,441
Nails, tacks	604	446	578
Bolts, nuts, rivets	67	57	13
Castings, forgings	133	169	110
Total	29,401	30,966	38,344

(1) Manganese content.
(2) Chromium content.
(3) Silicon content.

DESTINATION OF OCTOBER EXPORTS
Gross Tons

	Galv. steel sheets	Tin, terne plate	Black sheets	Steel bars
Argentina	.....	526	45	2
Brazil	172	254	16	28
Canada	167	178	2,280	389
Cent. America	217	6	14	81
Chile	1	139	9	461
China	221	741	224	145
Colombia	166	47	.....	1
Cuba	241	150	12	36
Dutch E. Ind.	32	.....	2	.....
Finland	18	.....	.....	.....
France	.....	.....	555	2
Japan	5	2,227	191	68
Java	32	258	.....	.....
Mexico	199	438	108	21
Norway	38	.....	.....	.....
Panama	62	.....	.....	60
Philippines	1,033	231	6	212
Peru	80	370	.....	163
United King.	.....	.....	1,034	1,843
Uruguay	22	381	20	.....
Venezuela	122	17	6	15
Total	3,242	6,138	4,687	3,653

ORIGIN OF OCTOBER IMPORTS
Gross Tons

	Iron ore	Pig iron	Man-ganese	Ferro-man-ganese
Australia	5,004	.....	.....	.....
Brit. Ind.	.....	3,916	2,600	.....
Brazil	.....	.....	7,463	.....
Canada	.....	103	.....	672
Chile	45,276	.....	.....	.....
Cuba	11,000	.....	.....	.....
Germany	.....	150	.....	118
Gold Coast	.....	.....	2,335	.....
Hong Kong	.....	2	.....	.....
Kwantung	.....	200	.....	.....
Netherlands	.....	211	.....	.....
Norway	.....	51	.....	33
Soviet Russia	8,667	.....	8,980	.....
United King.	75	300	.....	50
Total	70,022	4,413	21,378	873

EXPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Item	Oct., 1931	Sept., 1931	Oct., 1930
Pig iron	456	668	1,419
Ferromanganese, spiegeleisen	8	36	.....
Scrap	13,512	10,000	12,611
Ingots, blooms	113	950	579
Iron bars	35	98	92
Steel bars	3,653	2,000	5,263
Alloy steel bars	125	37	286
Wire rods	1,621	2,675	1,637
Boiler plate, not fabr.	1,845	2,523	4,954
Skelp	4,089	3,577	20,061
Iron sheets, galv.	210	202	473
Steel sheets, galv.	3,242	2,889	6,123
Steel sheets, black	4,687	6,639	15,494
Iron sheets, black	195	234	908
Hoops, bands	1,891	1,098	1,916
Tin, terneplate	6,138	7,236	13,569
Shapes, not fabr.	3,605	9,520	10,801
Shapes, plates, fabr.	426	843	6,026
Metal lath	168	255	343
Frames, sashes, sheet piling	53	191	2,099
Rails	888	1,576	1,546
Rail fastenings	377	307	1,032
Boiler tubes	549	656	837
Casing, pipe, seamless and welded	407	1,126	3,295
Malleable-iron screwed pipe fittings	241	218	669
Iron screwed pipe fittings	55	96	489
Iron pressure pipe, fittings	425	887	839
Iron soil pipe, fittings	57	161	920
Welded black, galv. steel pipe	4,064	7,201	4,390
Welded black, galv. wrought pipe	189	594	703
Plain black or galv. wire	1,221	835	2,227
Barbed wire, woven fencing	1,134	1,005	2,901
Woven-wire screen cloth	54	55	73
Wire rope	189	211	266
Wire nails	934	340	733
Tacks	50	37	35
Bolts, nuts, rivets	328	272	645
Iron castings	274	246	228
Steel castings	157	99	498
Car wheels, axles	264	523	1,445
Forgings	336	533	520
Total	59,335	69,768	131,845

Industrial Men in the Day's News

Boyd Fisher, General Manager, National Machine Tool Builders' Association

HE brings to his new position 21 years of experience in scientific management.

ACTING chiefly in advisory capacities, his work has taken him into many concerns.

DURING the World war he trained employes for government arsenals.

ACTIVE in management, efficiency methods and personnel study covering a wide field, Boyd Fisher, recently elected general manager of the National Machine Tool Builders' association, Cincinnati, comes to that position from the Irving Trust Co., New York, well qualified to fill the position. He assumes his new duties at Cincinnati headquarters Dec. 15.

Mr. Fisher is a native of Iowa, reared at Kansas City, Mo., and a graduate of Harvard in the class of 1910, making his own way through the Cambridge institution by outside newspaper work. Leaving Harvard, Mr. Fisher went to New York as executive manager of the Efficiency society, an organization specializing in the promotion of scientific management.

Mr. Fisher remained in this position until 1914, when he went to Detroit as vice president and executive officer of the Executive club, Detroit. This organization, devoted to the study of executive management, started with a membership of six factories and in three years had a membership of 40 with a staff of ten assistants to Mr. Fisher, covering problems in production, costs, purchasing, employment, welfare and other industrial groups. In 1917, with the outbreak of the war, Mr. Fisher and his entire staff entered the service, he as manager of employment for arsenals and later in charge of training for such managers.

Returning to Detroit in 1919, he became personnel supervisor at 12 plants of the Aluminum Castings Co., also filling the position of assistant works manager at the Detroit plant.

In agreement with the company he became consultant for the Brighton Mills, Passaic, N. J., and also acted as consultant with other manufacturers. Following a merger in 1920 in Detroit, Mr. Fisher went with Lockwood-Greene Co., Boston, in 1920, in charge of personnel at the various units of that company, where he remained for three years. He resigned in 1923 to become a consultant in management problems with headquarters in New York, also devoting some time to writing on this and other subjects.

His work as consultant expanded steadily and finally absorbed all his efforts. He was in charge of training sales forces for 14 branches of the Hudson Valley Fuel Corp., Troy, N. Y., and made his headquarters in that city for about one year. Following a merger that involved the fuel corporation, Mr. Fisher again returned to New York and became connected with the Irving Trust Co., receiver division, January, 1930, the position which he now leaves.

A. L. MEYER, formerly general sales manager, has been appointed vice president in charge of sales, Alan Wood Steel Co., Conshohocken, Pa. Mr. Meyer first became affiliated with the steel industry in 1916, in the metallurgical department of the Midvale Steel & Ordnance Co., Nicetown, Pa. Shortly after he served in the World war, and in 1919 became metallurgical engineer for Lukens Steel Co., Coatesville, Pa. In 1921 he became affiliated with the Alan Wood company in the same capacity, and in 1926 he was transferred from the operating to the sales department. The following year he became associated with the Illinois Steel Co., Chicago, in the alloy bar department. Two years later he returned to the Alan Wood Steel Co., in the sales department where he has since remained.

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Charles W. Flint, president, Tulsa Rig & Reel Co., Tulsa, Okla., was recently elected president, Tulsa Boiler & Machinery Co., to succeed J. E. Carnahan, Canton, O., who has retired on account of ill health. M. H. Kotzebue was re-elected vice president and general manager, and S. L. Spence, secretary-treasurer.

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Col. Albert T. Perkins has been elected chairman of the board, Fulton Iron Works, St. Louis. Other directors recently elected are: Jacob Chasnoff, R. Walston Chubb, G. G. Cook, Walter

F. Heinecke, E. Q. Kopke, Sidney Maestre, T. O. Maloney, P. B. Postlewaite, Mark C. Steinberg and John B. Strauch.

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Cary Wright has been appointed manager, Ideal Furnace Co., Milan, Mich., succeeding Everett Betts, resigned. Mr. Wright formerly was connected with the United States Radiator Corp.

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William Vaughn, formerly general purchasing agent, Heintz Mfg. Co., Philadelphia, is now associated with Hill-Chase & Co., steel jobbers, Philadelphia, in their sheet sales department.

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George E. Madden, formerly identified with the Industrial Silica Corp. at Pittsburgh has joined the sales department of the Duquesne Steel Foundry Co. and Wheeling Mould & Foundry Co. with offices in the Grant building, Pittsburgh.

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W. A. Bechtel, formerly vice president, Six Companies Inc., contractor on the Hoover dam, and formerly president, Associated General Contractors of America, has been chosen president of Six Companies Inc., to succeed the late William H. Wattis.

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H. W. Haapanen has been appointed district manager in the West Virginia mining territory, Charleston, W. Va., for Webster & Weller Mfg. Cos., Chicago. He was formerly affiliated with the Fairmont Mining Machinery Co. and various coal companies.

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George C. Pascall has been made president and treasurer of the Pickering Governor Co., Portland, Conn. Mr. Pascall entered the employ of the Pickering Governor Co. in September, 1902, and has served over 29 years in various capacities. Heman Ely has been elected chairman of the board, succeeding the late Stephen S. Hall.

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A. H. Kramer, Advance Foundry Co., Dayton, O., was re-elected president, Ohio Foundries association, Cleveland, at its annual meeting, Columbus, O., Nov. 19. Other officers re-elected were: J. H. Bruce, Bowler Foundry Co., Cleveland, vice president; Charles Seelbach, Forest City Foundry Co., Cleveland, treasurer; and Robert Hoierman, Cleveland, secretary.

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Samuel M. Hastings, chairman of the finance committee, Dayton Scale Co., Chicago, has been nominated for president of the Illinois Manufacturers' association for 1932. Thomas S. Hammond, chairman of the Whiting Corp., Harvey, Ill., has been nominated for first vice president, and Harvey A. J. McKay, Matthiessen & Hageler Zinc Co., LaSalle, Ill., second vice president.

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William M. Culbertson has been appointed in charge of oil country tubular products sales for International-Stacey Corp., Columbus, O., with headquarters at that point. Mr. Culbertson was formerly special representative for Wheeling Steel Corp., Wheeling, W. Va., prior to which he was general manager, Monongahela Tube Co., Pittsburgh, in charge of sales and operations.

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Ernest F. DuBrul, for the past ten years, general manager, National Machine Tool Builders' association, Cincinnati, has resigned to engage in the private practice of consultant on finance, marketing and management with headquarters at 1415 Enquirer building, Cincinnati.

Following college education, he became secretary, Miller DuBrul & Peters Mfg. Co., of which he was later vice president and in 1915, president; a commisioner of the National Metal Trades association from 1902 to 1904, and president of the Pyro Clay Products Co. since 1909. He is a member of various associations and societies and recently won international recognition for a paper presented at the International Management institute.

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E. N. Martin has been appointed Canadian manager, British Empire Steel Export association, with offices in the Sun Life building, Montreal, Que. The association is made up of 13 companies which propose to distribute large shapes and plates not at present produced in Canada.

Obituaries

ANDREW TELFER, formerly manager of the Pittsburgh works of the National Tube Co., died Nov. 19 at his home, Tampa, Fla. Mr. Telfer was born in Boston in 1877 and was graduated from Syracuse university in 1899. He was identified with the National Tube Co. for a number of years before going to Pittsburgh in 1919 as manager of the Pittsburgh works. He retired from that position in January, 1930.

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Walter S. Marvin, 45, vice president and general manager, Metal Ware Corp., Two Rivers, Wis., died Nov. 22.

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Silas Izant, 79, vice president, Prince & Izant Inc., Cleveland, died in Washington recently. Prior to forming the Prince & Izant company ten years ago, he was affiliated for 38 years with Bishop & Babcock Co., Cleveland.

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Donald Fraser, 78, former vice president and a director, Chain Belt Co., Milwaukee, died Nov. 20. He was a native of Canada and went to Minneapolis at an early age, entering the pattern business. The business was moved to Milwaukee in 1887 and in 1895 Mr. Fraser joined the Chain Belt Co., becoming vice president and works manager. He retired in 1917 but remained a director, holding similar positions in the Federal Malleable Co. and Sivyer Steel Casting Co.

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Herman D. Morton, for 30 years with Simonds Saw & Steel Co., Fitchburg, Mass., and in charge of sales, Boston office, for a good part of that time, died last week at Wollaston, Mass., Previous to his connection with the Boston office Mr. Morton was located at the main plant at Fitchburg.

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C. J. Prendergast, manager, St. Louis district, Bailey Meter Co., Cleveland, died Nov. 21 at New Albany, Ind. He was born in Northeast, Pa., and entered the Bailey Meter Co. employ in 1925. After two years of sales and engineering work he was transferred to the Boston branch. He became the St. Louis manager in 1929.

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Edward F. Hasbrook, 60, in charge of purchases for Chicago, Burlington & Quincy railroad, died at Chicago, Nov. 22. He had been continuously in the purchasing department of the Burlington for 43 years. He became assistant purchasing agent in 1918 and in 1930 became head of that department.

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John W. Garland, 64, former president, Garland Corp., West Pittsburgh, Pa., died at New Haven, Conn., Nov. 21. Born in Ireland, Mr. Garland was confidential clerk for 18 years for the late Sen. George T. Oliver, head of Oliver & Roberts Wire Co. following which he started his own structural steel business. In 1893, with his brother, he began the manufacture of an automobile chain. Several years later he made the first electrical steel conduit, initiating a business that expanded so that he bought the village of Moravia, Pa., and started the town of West Pittsburgh in 1903 to provide facilities for the Garland Corp., and its subsidiaries. He retired in 1918.

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Robert G. Crawford, president and general manager, Atlas Foundry Co., Detroit, died in that city Nov. 22. Following a 7-year apprenticeship to the molding trade in Glasgow Mr. Crawford moved to the United States in 1902, and for varying periods up to 1908 worked at his trade. In 1908 he moved to Detroit to become foreman of the Detroit Foundry Co., later taking a similar position with the Murphy Iron Works. When the Atlas Foundry Co. was organized in 1910 he was appointed foreman, and the following year superintendent.

MIRRORS of MOTORDOM

DETROIT

AUTOMOTIVE industry approaches December with actual production scarcely 10,000 units a week, and this insignificant rate largely supported by Buick, which is just topping off a 9000-car month.

Chevrolet is gradually gaining momentum, although to date it has produced more parts than it has assembled cars. But with Ford still assembling only 200 units a day—mostly commercial models—and the assembly lines of 10 important manufacturers still idle, interest centers on what is new for 1932.

Chevrolet has definitely set on Saturday, Dec. 5, for the introduction of its 1932 models. Chief among the changes will be the combination syncro-mesh and free wheeling transmission. The latter feature is based on a spring type of over-running clutch, controllable from the dash.

As predicted, the 1932 Chevrolet is to have down-draft carburetion and a lengthening of the radiator shell with a vertical-lined grille built in, which is to be chromium plated.

Thinner Walls for Bearings

The motor, still a six, retains the same bore and stroke but develops a peak of 60 horsepower. Addition of ribs to the cylinder and crankcase lining has been made. Crankshaft main bearings are improved by the adoption of thinner walls.

The entire front of the frame has been redesigned, with the front cross member consisting of a single steel stamping drawn, inside of the flanges, into a double channel section having a wide flange at each edge of the channels. A cross member between front fenders is similar to that used on the Olds.

Springs have been changed in the front axle steering tie rod. The tire section is larger, the wheels smaller on the 1932 models.

Windshields have been slanted and the closed models are visorless. Front seats are to be adjustable on all closed models. Hood ventilators are similar to those on the new Buick.

Straight Eight for Olds?

Olds is reported planning the introduction of the 8-cylinder model it has held in abeyance for some time. Last year the expense was known to have withheld production, but for 1932, the decision is said to have definitely been reached.

Both 6 and 8-cylinder Olds models will have wider, roomier bodies, especially in the rear, than the present six. The radiator design is said to resemble the new Buick, although the fact is the lower lines of the Buick are a takeoff of the present Olds radiator.

Graham-Paige went into assembly of its 1932 offering on Nov. 17, but in limited number. Due to the way in which parts, such as steel metal stampings, were allocated among a great many suppliers, difficulties have now arisen to correlate deliveries.

The new models, in addition to incorporating a new drop frame principle described previously in these columns, are to have a sloping front radiator, the water cap will be inside of the hood, front and rear fenders will conform closely to the wheel's shape instead of the former "flare-out", the cars will be visorless, and all will be offered with free-wheeling.

The company is to offer an eight below $1200. A new burglar proof lock is to be standard equipment, but the increasingly popular "ride control" will not be offered.

Hudson-Essex, after giving last-minute directions to its important dealers who were summoned to Detroit recently, is embarking on the largest advertising campaign in its history, calculated to last about a month. Its 1932 models are due within the next three weeks.

Packard, in spite of reports that it would stand pat in 1932 on the models it introduced last summer, had inquiries out recently on several sheet metal parts, one of which for revised fenders did not go to an outside source of supply, but to Packard's own shop.

Though Studebaker's South Bend assembly lines are closed, the plant is far from inactive. Part suppliers are being pressed for deliveries and several good-sized production lots of steel have been placed. The 1932 Studebaker will not be altered greatly, with the one exception of the appearance of the hood and radiator.

Chrysler's activity is still clouded, but apparently little steel has been bought for any of its divisions recently, and several usual outside sources of supply on sheet metal stampings have received little inquiry.

Cadillac-LaSalle resumed assemblies last week, but on an irregular scale.

The Pontiac division of General Motors is scheduled to resume Dec. 1.

Wrecks Into Open Hearth

Completion shortly of the new 400-ton tilting open-hearth steel furnace at the Ford steel plant will radically revise the company's steelmaking practice.

Primarily, the new furnace will supply hot scrap for the other nine 100-ton furnaces comprising the Ford open-hearth department. The furnace will melt junked cars, compressed to a shape resembling a bale of hay, whereas formerly the wrecks were pressed down to resemble a pancake.

The hot metal resulting from the melting of these scrapped cars will go to two new mixers, each of 600

tons capacity, where it will be mixed with hot metal from the two Ford blast furnaces. One of the furnaces, incidentally, is being modernized. The old open-hearth mixer was shipped recently to the new Ford plant at Dagenham, Eng.

Boilers of a combined capacity of 1100 horsepower and utilizing waste heat from the 400-ton open-hearth furnace will generate steam for the 1000-ton shear, cutting heavy scrap.

Midland Steel Products is furnishing Hudson its rear axle housing stamping only, on which it is completing machining operations necessary to furnish the finished stamping at the Parish & Bingham plant in Cleveland, instead of the complete rear axle as stated inadvertently recently.

Communist Wage Theory Intolerable, Stalin Says

Russia's experience with communism has shattered one of the basic theories advanced by Marx and Lenin, according to Joseph Stalin, general secretary, communist party of the soviet union and acknowledged ruler of Russia.

"They said that the difference between skilled and unskilled labor would exist even under socialism, after the destruction of classes, and that only under communism would it disappear," he is quoted as saying, in the union's official *Economic Review*.

The text of his speech to the conference of industrial directors in Moscow several months ago confirms news reports at that time to the effect the soviet is breaking away from the simon-pure communistic plan of wage payment.

"Labor turnover has become the foe of production, disorganizing our enterprise," said Stalin. "Wherein lies the cause of this turnover? In the wrong wage-scale system, in the 'leftist' equalization of wages. In a number of enterprises our scales are so determined that the difference between skilled and unskilled labor, between hard and easy work, has almost completely disappeared. . . . We must not tolerate a situation where a steelworker receives the same wage as a sweeper, or a locomotive engineer the same as an office clerk."

Stalin's words reveal how practical experience has overthrown other communistic theories. There must be "incentive" for the individual, it has been found. Skilled workers must be "attached" to the enterprise; industry must be provided with technical and engineering skill, and these special benefits recognized. Stalin denounced as "foolish" the communists' policy to create "a closed caste", and declared "nonparty persons" must not be barred from opportunity, but given quick promotion to leading positions.

Here and There in Industry

GRINDLE FUEL EQUIPMENT CO., Harvey, Ill., for 10 years a subsidiary of the Whiting Corp., Harvey, was absorbed by the parent company Nov. 13 and will be operated as a separate department under the name Pulverizing and Combustion Equipment Division. W. R. Bean, formerly president of the Grindle Fuel Equipment Co., has been made vice president of the Whiting Corp. in charge of the newly formed division.

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Wright Mfg. Co., a subsidiary of the American Chain Co. Inc., has moved its general sales offices from Bridgeport, Conn., to York, Pa. The company manufactures hoists, trolleys, cranes and electric hoists.

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Ex-Cell-O Aircraft & Tool Corp., Detroit, has appointed Burton, Griffiths & Co. Ltd., Montgomery street, Sparbrook, Birmingham, Eng., its exclusive representative in England for drill jig bushings, internal grinding spindles and precision diamond boring machines.

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Frank Davis Mfg. Co., Pawtucket, R. I., manufacturer of bobbin boards and metal trucks, has been incorporated to succeed the company formerly owned entirely by Frank Davis, his two sons joining in the new company. Frank Davis is president, Frank W. Davis vice president and secretary, and Albert E. Davis manager.

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Ford Motor Co. has given a contract to Arthur G. McKee & Co., Cleveland, for reconstructing and enlarging a blast furnace stack at its works at Dearborn, Mich. Among changes will be installation of McKee offtakes and downcomers, dust catcher and centrifugal dust collector. Cost of the improvements has been estimated to be about $160,000.

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Metal Package Corp., Chicago, subsidiary of the McKeesport Tin Plate Co., McKeesport, Pa., has leased 60,000 square feet of floor space in the Ashland Industries building, 1845-1903 West Seventy-fourth street, Chicago, for a plant. Heretofore only a sales office has been maintained in Chicago Installation of machinery for the manufacture of metal containers is to be started at once. The company has plants in Brooklyn, Baltimore and Maspeth, L. I.

STEEL SHEET PILING AND WALING USED IN OPEN LAKE: This new breakwater to protect an extension of Lincoln park, Chicago, is reported to be the first of all-steel construction on a location exposed to severe storms and choppy waves. It is believed this will demonstrate steel construction as the logical type, from the standpoint of stability, speed of installation, and economy. The Great Lakes Dredge & Dock Co., Chicago, built the wall with steel supplied by the Inland Steel Co.

EDITORIAL

Contractual Relations Are Due for Improvement

WHETHER the standards of business ethics in the United States are rising or falling is a matter of opinion. Most authorities seem to agree that the long time trend is upward and that under ordinary circumstances a steady improvement in business methods can be expected. In times of hardships, however, the temptation to "cut corners" is greater and if the pressure of this demoralizing influence is strong enough and if it continues long enough there is danger of a serious setback in the march toward better business principles.

Right now the situation is especially aggravating. In practically every branch of industry one finds reports and criticisms of practices which cannot be termed ethical even under the most liberal interpretation. Here and there are conditions justly described as "racketeering."

The majority of industrial executives resent these sharp practices, but in times like the present they are almost powerless to curb the unprincipled actions of the minority. Aside from the ethical phase, the most disconcerting feature of the problem is the terrific cost of business hoodlumism. It is not uncommon for a company, which by dint of skill and care in the engineering and operating departments has saved a few thousand dollars on a large contract, to lose double that sum in bargaining.

Abuses of Contract Responsible for Large Losses To Industry

The waste resulting from defective contracts, failure to live up to agreements and other abuses in contractual relations probably runs into hundreds of millions of dollars annually.

Consider the practice of awarding work or orders to the "lowest" bidder. Presumably the device of the sealed bid was adopted by governments, institutions and others with the idea that it would afford a fair basis for competition among bidders. Unfortunately in many lines of business the sealed bid has dropped to low estate. It is no secret among contractors, producers and machinery builders that when certain buyers advertise for bids, the lowest figure submitted will be utilized by the buyer in shopping around for still lower offers. Nor is the abuse of bidding practice confined to the buyers. Not a few sellers are guilty of practices which have helped to make the sealed bid a ghastly joke.

Sometimes the buyer does not deal directly with the seller, but with a third party. In the case of material and equipment for buildings, the general contractor often represents the owner. Many general contractors are reputable and able, but there are others who collect bids from responsible sub-contractors, make a profit on forced cuts on bids, and who pay the subcontractors, only when threatened by law. Conditions have become so bad in certain parts of the building industry and in the contracting departments of certain large cities that reputable concerns prefer not to submit bids. In the words of one disgusted bidder, "an honest bidder should be given a bonus to take business so permeated with graft."

Experience With Fair Trade Conference Idea Has Been Disappointing

What is the remedy for this deplorable situation? Graft, as practiced largely in municipal and county governments, will be curbed when the public wakes up to what has been going on. In industry the problem of raising business standards is made difficult by the uncertainty of government assistance. About three years ago the activity of the federal trade commission in connection with codes of trade practice was received hopefully by industry as a sign that some assistance might be given to those industries desiring to clean their own houses. Unfortunately the commission's policies have been so unstable that industry cannot depend upon them. Apparently each division of industry is back where it started before the trade practice conference idea was introduced.

In the long run business will have to depend heavily upon its own resources to elevate the standards of business ethics. Each group, through its trade association, can attack the problem along two lines; first, improvement of the contract forms used by its members and second, continuation of the educational campaign against unfair practice.

The first objective is worthy of more attention than has been given to it. Simplify the terms of contracts, minimize the chance for misunderstandings, and try to work more closely with principles. Correct contractual relations and much of the present trouble will disappear.

THE INDUSTRIAL DIAL

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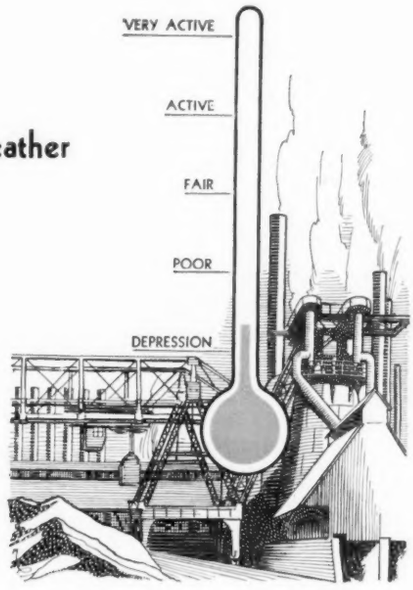
THE wave of optimism promulgated by the recent flurry in wheat prices and the easing of the banking situation has subsided, leaving an aftermath of uncertainty as to the future of business. Hopes that October would prove to be the low point in industrial activity are likely to fall short of realization.

Industrial Weather



TREND:

Unsettled

Where Business Stands

Monthly Average, 1930—100

	Oct., 1931	Sept., 1931	Oct., 1930
Steel Ingot Output	**46.3**	**46.7**	**78.2**
Pig Iron Production	**43.8**	**43.9**	**81.0**
Freight Movement	**79.9**	**82.7**	**100.8**
Building Construction	**72.2**	**70.7**	**92.8**
Automobile Output	**27.8**	**48.9**	**54.4**
Wholesale Prices	**75.3**	**77.2**	**93.6**

Output of steel ingots in November should show a slight gain over October, but the outlook for a rise in pig iron production is not promising. Another slump in automobile output is indicated by the weekly figures thus far in the eleventh month. Car loadings also will be down from October figures. Therefore, aside from a gain from around 27 to about 31 per cent in the operating rate of steelworks, there is little actual improvement to be expected in November statistics.

Commodity prices, which failed to respond to the buoyant influence of wheat, again are easing gently downward. STEEL's composite, while remaining almost stationary for a month, is more likely to drop than to rise.

The chief accomplishment of the last few months has been the clearing of the financial atmosphere. This removed fear of panic, but business still faces the job of restoring confidence.

The Barometer of Business

Industrial Indicators

	Oct., 1931	Sept., 1931	Oct., 1930
Pig iron output (Daily average, tons)	37,831	38,947	69,851
Machine Tool Index	57.4	63.1	113.3
Unfilled orders (tons)	3,119,432	3,144,833	3,639,636
Ingot output (Daily average, tons)	58,977	59,523	99,724
Dodge Bldg., awards in 37 states (sq. ft.)	30,700,200	30,068,100	39,483,700
Automobile output	81,300	143,212	158,942
Coal output, tons	7,997,200	31,806,000	9,514,000
Business failures; number	2,362	1,936	2,121
Business failures; liabilities	$70,660,436	$47,255,650	$56,296,577
Cement production, Bbls.	10,762,000	12,092,000	14,410,000
Cotton consumption, bales	462,025	463,704	444,494
Car loadings (weekly average	762,631	726,988	950,219

Foreign Trade

Exports	$205,000,000	$181,000,000	$326,896,000
Imports	169,000,000	171,000,000	247,367,000
Gold exports	398,604,000	28,708,000	35,635,000
Gold imports	60,907,000	49,240,000	9,266,000

Financial Indicators

	Oct., 1931	Sept., 1931	Oct., 1930
25 Industrial stocks	$146.56	$156.80	$240.49
25 Rail stocks	$44.72	$46.44	$97.30
40 Bonds	$72.38	$77.57	$86.15
Bank clearings (000 omitted)	$32,079,120	$30,709,656	$44,983,152
Commercial paper rate, N. Y., per cent	3.13	2	3
*Commercial loans (000 omitted)	$7,624,000	$7,867,000	$8,707,000
Federal Reserve ratio, per cent	67.1	79.4	81.6
**Railroad earnings	$55,318,586	$55,858,736	$104,078,334
Stock sales, N. Y. stock exchange	47,895,000	51,140,000	65,497,000
Bond sales, par value	$346,979,000	$318,310,000	$272,130,000

*Leading member banks Federal Reserve System.
**September, August and September, respectively.

Commodity Prices

		One month ago	One year ago
STEEL's composite average of 14 iron and steel prices	$30.74	$31.03	$32.26
Bradstreet's index	$8.09	$8.30	$10.06
Wheat, cash (bushel)	51c	48c	0.99
Corn, cash (bushel)	54c	60c	1.01
Petroleum, crude (Bbl.)	60c	60c	$1.08

Thumb Nail Sketches Of Business

Copper Stocks Estimated

When the time came for release of copper statistics for October, the American Bureau of Metal Statistics stated that the usual report could not be given out because data from some of the producers had not been received. In the absence of actual figures, experts estimate a further increase in the backlog of stores of refined copper in North and South America. The stocks, amounting to 479,896 tons as of the report for September, now are believed to be in excess of 495,000 tons—the largest in history.

Employment Continues To Decline

Employment dropped slightly in practically every branch of industry in October, according to the various barometers. The index of *The Annalist* stood at 72.1 for October as compared with 74.4 for September. The index of factory payrolls dropped from 59.4 in September to 56.7 in October. The indexes of the U. S. Bureau of Labor Statistics reflected similar declines.

Freight Off 19 Per Cent from 1930

Car loadings in 1931 up to and including the week of Nov. 7 totaled 33,096,473 cars compared with 40,786,567 in the same period of 1930 and 46,720,639 in the corresponding period of 1929. The 1931 loadings to date are 81.2 per cent of the comparable loadings in 1930.

See Halt To 7-Month Decline

Report of the American Iron and Steel institute shows steel ingot operations in October at 27.76 per cent of capacity. According to weekly estimates, steelworks operated at 30 to 31 per cent in the week of Nov. 2, 31 per cent in the weeks of Nov. 9 and Nov. 16 and about 32 per cent in the week of Nov. 23. On the basis of these weekly determinations, it is expected the November ingot production and operating rate will show slight ncreases after consecutive recessions in seven months.

Business Trend Charts of the Month

Production

Steel ingot production	Nov. 16, p. 28
Pig iron production	Nov. 16, p. 29
Blast furnace production rate	Nov. 16, p. 29
Industrial production	Nov. 2, p. 36
Bituminous coal output	Nov. 30, p. 29

Demand

Unfilled orders, U. S. Steel Corp.	Nov. 23, p. 29
Railroad car orders	Nov. 16, p. 30
Index of machine tool orders	Nov. 23, p. 29
Index of foundry equipment orders	Nov. 23, p. 30
Building construction	Nov. 23, p. 30
Steel castings, orders	Nov. 9, p. 30
Structural steel sales	Nov. 9, p. 29
Automobile production	Nov. 9, p. 30
Steel sheets, orders	Nov. 2, p. 38

Prices

Bradstreet's index of commodity prices	Nov. 23, p. 28
Iron and steel price index	Nov. 30, p. 29
Foundry pig iron prices	Nov. 9, p. 29

Miscellaneous

Foreign trade	Nov. 30, p. 28
Freight traffic	Nov. 2, p. 37
Commercial failures	Nov. 16, p. 30
Iron and steel imports and exports	Nov. 2, p. 37
United States Steel Corp. earnings	Nov. 9, p. 28
Monthly railroad earnings	Nov. 2, p. 38

Exports Gain, Imports Decline Causing Increase in Trade Balance

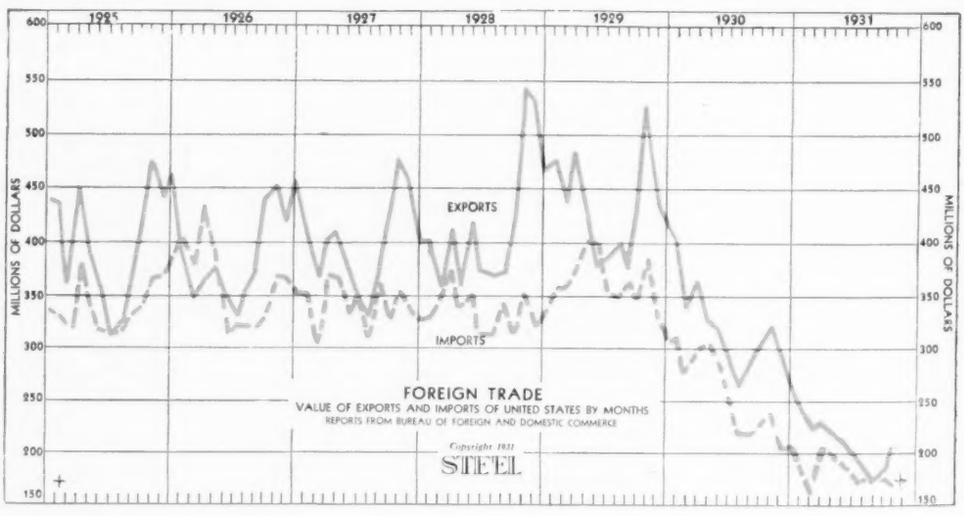
A favorable trade balance of approximately $36,000,000 has widened the margin between exports and imports in the October international trade of the United States. The sharp increase in the trade balance was due to an advance in exports from $181,000,000 in September to $205,000,000 in October, the best month since May of this year; and a decrease in imports from $171,000,000 in September to $169,000,000 in October—the smallest total, except August of this year, since the end of the war. The sharp recovery of October follows closely upon the adverse trade balance of $1,000,000 recorded in August. Heavier shipment of cotton was one of the factors in increasing October exports.

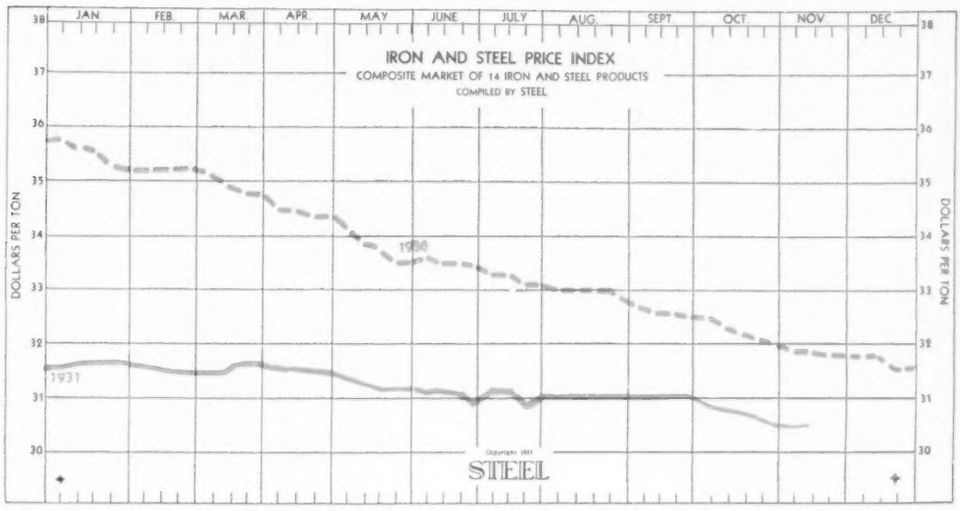
EXPORTS

Oct., 1931	$205,000,000
Sept., 1931	181,000 000
Oct., 1930	326,896,000

IMPORTS

Oct., 1931	$169,000,000
Sept., 1931	171,000,000
Oct., 1930	247,367,000





Monthly Averages

Oct.	$30.74
Sept.	31.03
August	31.05
July	31.05

Weekly Index

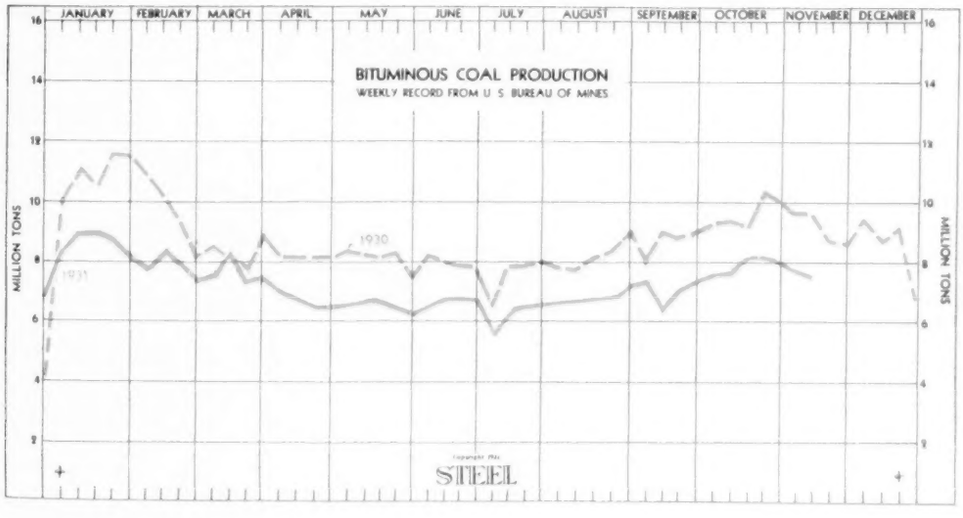
Nov. 21	30.63
Nov. 14	30.63
Nov. 7	30.63
Oct. 31	30.64
Oct. 24	30.68
Oct. 17	30.76
Oct. 10	30.78

Iron and Steel Prices Fluctuate in Narrow Range

The first three weeks of November witnessed no change in STEEL's iron and steel price composite from the quotation of $30.63. Iron and steel prices during August and September were conspicuous in their stability, monthly averages being $31.05 and $31.03 respectively. The trend, however, declined in October as the weekly index dropped from $30.82 to $30.64. The October average, $30.74, compares with $31.03 in September, $31.05 in August and $32.26 in October a year ago. It is the lowest monthly average since November, 1915, when the composite of 14 iron and steel products was $28.64. The movement of steel prices has been narrow, considering the drift of other prices.

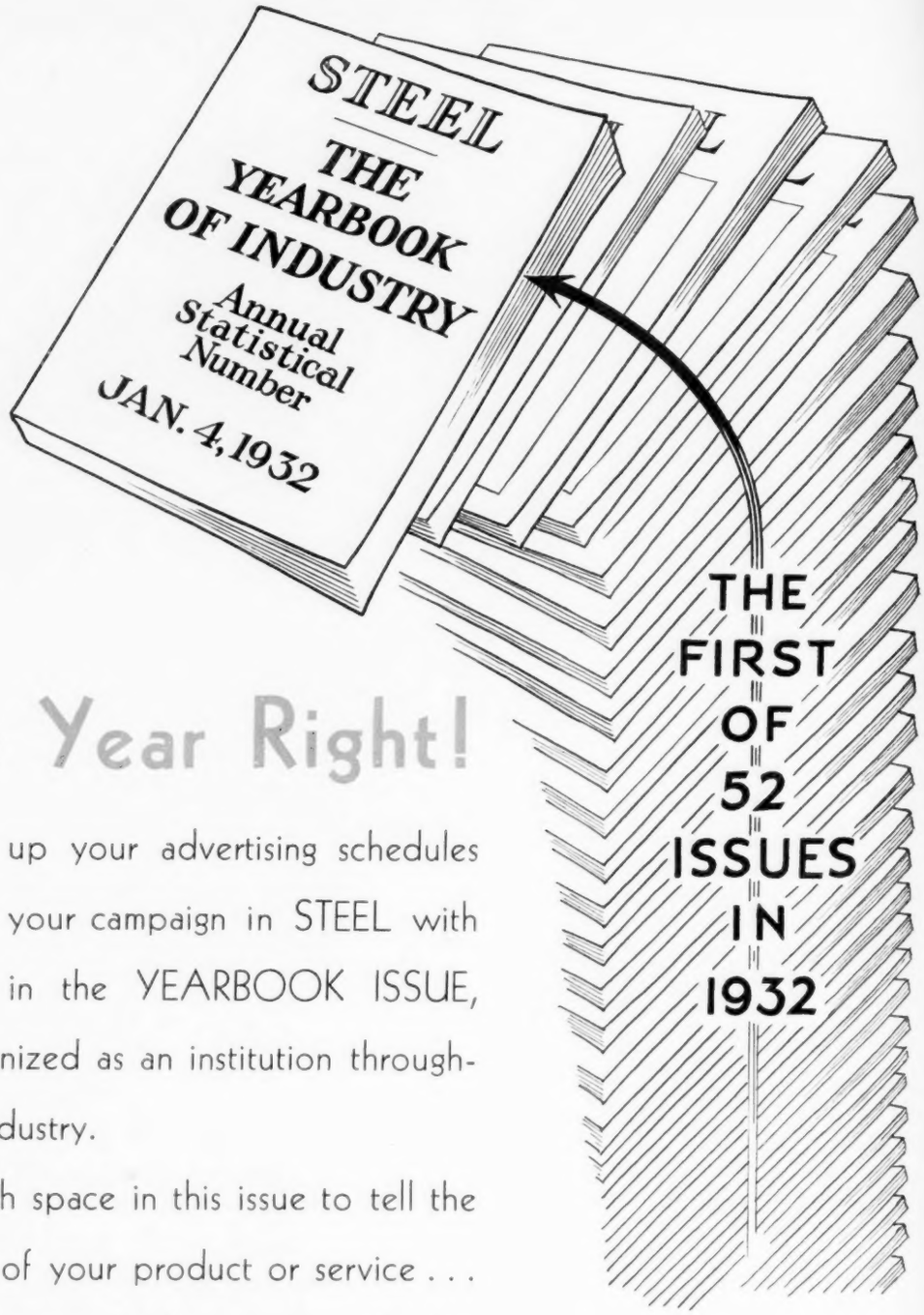
Production of Bituminous Coal Lags 20 Per Cent Behind 1930

Although the average daily production of bituminous coal for the week ending Nov. 14 advanced 46,000 tons, total output for the week dropped from 7,690,000 tons to 7,553,000 tons; this is accounted for by partially curtailed production on Armistice Day. During most of October coal output gained from 7,860,000 tons to 8,114,000 tons, however, the gain was small compared to the same period last year when production increased over a million tons. Production for the calendar year to Nov. 14 now stands at 332,983,000 tons, compared to 402,418,000 tons in 1930 period and 462,742,000 tons in the same period of 1929. Production is nearly 20 per cent behind that of last year.



Thousands of Tons

	1931	1930
Nov. 14	7,533	9,718
Nov. 7	7,690	9,708
Oct. 31	8,016	10,438
Oct. 24	8,114	9,232
Oct. 17	8,148	9,495
Oct. 10	7,848	9,304
Oct. 3	7,856	9,304



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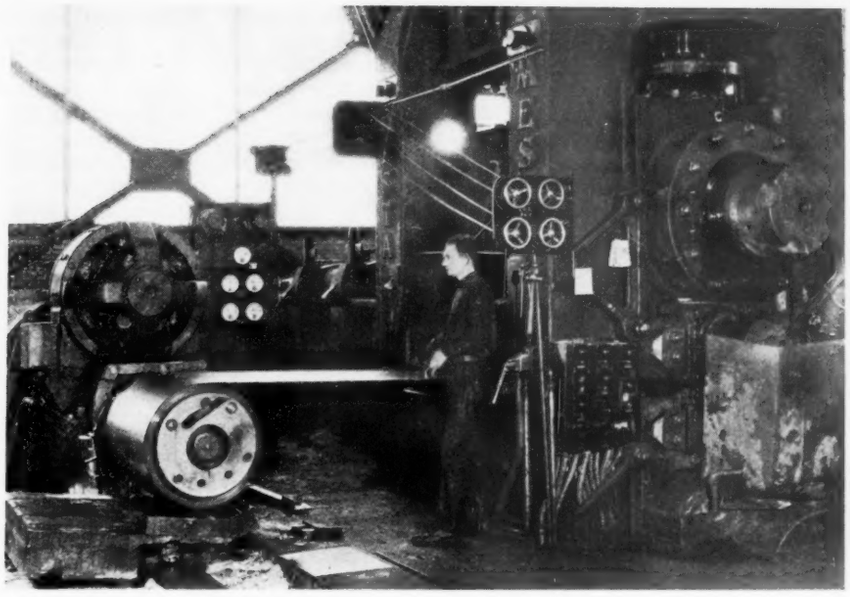


Fig. 1—A cold strip mill driven by a 500-horsepower, 250 to 750 revolution - per - minute, 250-volt, direct-current motor

The constant-tension reel (left) is driven by a 40 to 100 horsepower, 225 to 1125 revolution - per - minute direct-current motor

Motors and Control for Rolling Cold Strip Steel

BY FRANCIS MOHLER

COLD rolling of strip steel in the four-high roller-bearing mill is a comparatively recent development and this advance has called for larger motors of improved design and required radical changes in methods of control. The accompanying article, the first of two installments, considers the requirements for mill and reel motors, discusses the controls for these motors and explains the two methods of threading the reel. The concluding installment will deal with the tension of the strip between mill stands and, to afford some idea of equipment involved, will describe a typical cold strip mill installation. The author is associated with the industrial engineering department, General Electric Co., Schenectady, N. Y.

THE potential market for thin wide steel strip of uniform gage, the rolling of which is beyond the scope of the continuous hot strip mill, seems to be almost unlimited. In addition to extremely thin gages, the cold strip mill can produce strip of varying degrees of hardness and finish suited to the particular products for which it is to be used. Therefore, in view of the increasing range of application, the cold rolling of strip steel has become a subject of considerable importance in the last few years. The art is old, but the advent of the four-high roller-bearing mill, which makes it possible to roll wide strip with some degree of accuracy, marks the beginning of the recent progress in the industry.

This advance has called for larger motors of improved design and for radical changes in control. Necessity for low threading speeds; high rolling speeds; tension between stands to prevent wrinkling; smooth, simultaneous acceleration or deceleration to prevent stretching; and adaptability for rolling a wide range of products have caused these changes.

It is impossible to discuss all the variations in this article, therefore, a few generalities will be considered. In conclusion, a modern installation which possesses all of the requirements for rolling a high-quality strip at a highly productive rate will be described. The discussion will be limited to tandem mills, such as that shown in Fig. 2.

Selection of motors should be given careful consideration. Horsepower and speed range requirements depend entirely upon the mill design and the range of products

to be rolled, however, the actual types and speeds of the motors ordinarily are determined on the basis of cost and operating efficiency.

Without a doubt, the modern tandem mill should be driven by adjustable speed direct-current motors for the following reasons:

1. If a constant-speed drive is used, production must be sacrificed in favor of the limiting type and size of strip, because the allowable rolling speed is determined by the width, gage and required finish.

2. Although strip may be rolled at high speeds, a low speed is necessary for threading it into the rolls. This is particularly true in the case of wide strip, as it is extremely difficult to enter the piece straight.

3. Various rolling schedules require different reductions on the individual stands to obtain a particular product, and it is necessary to control the looping between stands by speed control rather than by draft.

4. Where the strip is kept under tension, especially in the case of wide strip, accurate and readily adjustable speed control is essential.

The adjustable speed direct-current motor is ideally suited to the tandem mill drive since it furnishes a ready means of obtaining this desired flexibility in speed control. In addition, it is naturally a constant-horsepower motor, and the load on a cold-strip mill approaches this. The narrower strips usually are rolled at the higher speeds and the torque requirements are proportionately less.

Rolling Speeds Adjustable

Although the stands in a tandem mill are almost invariably duplicates, the gear ratios are decreased purposely in each succeeding stand, these ratios being based on a normal expected reduction in each stand and on using motors of the same speeds. This not only makes the motors duplicate in horsepower rating but allows them to operate at approvximately the same speed under normal conditions. Therefore, practically the whole speed range is available for adjustment of the allowable rolling speeds.

A reel is essentially a motor-driven drum, upon which the strip is wound as it leaves the final stand of the mill, as is shown in Fig. 1. As the winding operation progresses, the diameter of the coil increases and the motor must be slowed down correspondingly to prevent stretching or breaking the strip. As a matter of fact, changes in tension during winding affect gage so appreciably that load regulators are used almost invariably to control the speed in such a manner that constant tension is maintained.

Wide Motor Speed Range

The reel motor always is a direct current adjustable-speed machine, since even for a constant strip speed it must have a sufficient speed range to cover the change in speed resulting from build-up of the coil. Thus, if the diameter of the reel drum is 20 inches and that of the completely wound-up coil is 30 inches, the speed range of the motor must be at least 30 to 20 or 1.5 to 1. To make the regulator effective at the extreme limits, it is necessary to use a motor with a slightly broader speed range, say of 2 to 1.

Furthermore, it is obvious that the reel motor must have sufficient range to take care of build-up at any corresponding delivery speed for which the mill may be adjusted. Thus, if the mill were to have a delivery speed range of 2 to 1, the speed range of the reel motor would become 2 x 2 or 4 to 1.

Although almost innumerable refinements and modifications are available, there are in reality only two types of control, namely, rheostatic or constant potential, and adjustable potential.

Rheostatic control is commonly known as magnetic control. The power is supplied from a constant potential bus and the motor is started by successively reducing the resistance in series with the armature until the motor is directly across the bus and up to basic or full-field speed. From that point the motor is accelerated by inserting resistance in series with its field until it comes to full speed or any intermediate desired point, depending upon the setting of the field rheostat. This operation is controlled by contactors which are magnetically operated and function automatically in the proper sequence when the desired operation is indicated by pressing the proper push button. It is evident that the acceleration of each motor is independent of the others in the group.

The adjustable potential scheme of control is relatively simple compared to the constant potential equipment. The armature circuit consists essentially of a contactor and switch for disconnecting the motor from the variable potential bus. The motors are all started and accelerated together by building up the generator voltage through automatic control of the generator field. In this case, the motors are accelerated with whatever field is determined by the setting of the rheostats. This is possible here because the adjustable potential scheme gives in effect a magnetic controller having an infinite number of accelerating points and provides extremely smooth acceleration.

It is evident that these two types of control are basically different and the first step should be to select between them. Adjustable potential equipment is by far the most flexible, simple and satisfactory for tandem mills, but is not justifiable in all cases, because of the cost of the individual motor-generator set and its attendant switching and control apparatus. Thus, the question arises as to when it should be selected in spite of the cost and this depends on the kind of strip to be rolled.

Let us divide the numerous types and kinds of strip into two general classes as follows:

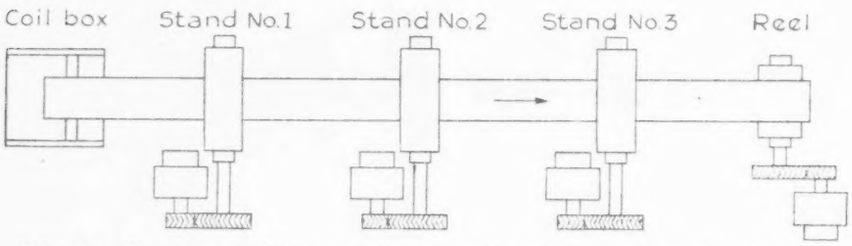
Class I: (a) Heavy gage which will stand considerable jerking and stretching without affecting the gage appreciably; and (b) Narrow strip which does not require tension between stands to eliminate wrinkles.

Class II: (a) Light gage which will not stand jerking or stretching without affecting the gage and tension between stands is necessary to eliminate wrinkles; and (b) Wide strip which invariably requires tension between stands to straighten wrinkles.

Choosing the Type of Control

In general, magnetic control is satisfactory for rolling Class I, and adjustable potential control is essential for rolling Class II. This is probably apparent from the fundamental differences already noted between these two types of control. Some further points may be interesting, however. It is impracticable to adjust separate magnetic controllers to accelerate with exactly the same characteristics, therefore, constant potential control must be so laid out that a slight time delay is obtained between the starting of successive stands so as to form a loop between the stands. If tension is desired, it must be obtained after the mill is threaded and running by speeding up each succeeding motor to take up the slack. This can be done smoothly by vernier adjusting rheostats, but they must be manipulated each time the mill is threaded. Thus, variations in tension during deceleration or acceleration, as well as the difficulty of getting the strip under tension, make magnetic control unsat-

(*Concluded on Page* 36)



Schematic layout of a three-stand tandem cold strip mill equipped with a reel

Shipbuilders Seek Nonrusting High Strength Steels

BY W. J. PRIESTLEY
Electro Metallurgical Co.

DECREASING dead weight without sacrificing high strength in ship construction is a problem which can be met in many instances by the use of alloy steels. The accompanying article, presenting data on a number of the newer alloy steels and pointing out their adaptability to shipbuilding work, was prepared by W. J. Priestley, vice president, Electro Metallurgical Co., New York, and presented as a discussion of a paper on ship materials read by Rear Admiral George H. Rock, at the thirty-ninth general meeting of the Society of Naval Architects and Marine Engineers, in New York, Nov. 19-20.

GREAT progress has been made in the steel industry during the past few years in developing higher strength steels and other noncorroding steels that are especially suitable for ship construction. It would appear that the steel manufacturers have not always passed along to the shipbuilder details of what has been developed in the steel industry, with the result that alloy steel is not being used to the same extent in the marine field as in other industries. Much of this information could be used to advantage by the naval architect.

Certain specifications must be met in steel suitable for ship construction and it is desirable that the steel be used in the "as-rolled" condition. Among these requirements, it must have characteristics that will allow it to be reheated for forming and shaping in the shipyard without destroying its original physical properties; it must not be an air-hardening steel; and it must be suitable for punching, shearing and riveting. Since welding is replacing riveted construction in many instances, the steel must be satisfactory for gas and electric welding, without local hardening or destruction of its original physical properties. In addition to these requirements, it must also have suitable strength and a high elastic limit with good ductility.

Specifications Must Be Met

Shipbuilders are seeking to decrease the dead weight of ships by using higher strength steel for hull construction. Many types of alloy steels offer greater strength than mild carbon steel, but not all high strength steels would meet the specifications mentioned above.

However, a steel has been introduced recently that likely will meet these requirements. This is an intermediate alloy steel containing 0.40 to 0.60 per cent chromium, 1.10 to 1.40 per cent manganese, 0.70 to 0.80 per cent silicon, and carbon ranging from 0.10 to 0.40 per cent, depending upon the tensile strength desired. It is known to the industry as "cromansil" steel (STEEL, Oct. 26, Page 46). It has high tensile strength and high elastic limit accompanied by good ductility, which permits the assumption of higher working stresses than are permissible in mild carbon steel. This allows the designer to use lighter sections and less weight for a given structure without lowering the factor of safety.

Rear Admiral George H. Rock, chief constructor, United States Navy, has outlined specifications for a high strength steel that would be of great value to the navy in lightening ship construction. These requirements are as follows:

Proportional limit (permanent set 0.0004-inch in 8 inches)—40,000 pounds per square inch minimum.
Ultimate tensile strength—88,000 pounds per square inch minimum.
Yield point (drop of beam)—55,000 pounds per square inch minimum.
Elongation in 8 inches—15 to 20 per cent, depending upon thickness.
Cold bend test—180 degrees around pin 2½ times the thickness of material

It will be noted from the following data that the chromium-manganese-silicon steel exceeds these requirements in every respect, including proportional limit, ultimate tensile strength, elongation, and reduction of area. Tests were made on 1½ x ⅜-inch bars, in the "as-rolled" condition, with the following results:

Proportional limit—42,100 pounds per square inch, by Huggenberger test, made with delicate extensometer; the usual laboratory procedure of stress-strain testing probably would have resulted in a higher figure.
Yield point—56,700 pounds per square inch.
Maximum stress—91,300 pounds per square inch.
Elongation in 8 inches—23.2 per cent; in 2 inches—42.0 per cent.
Reduction of area—63.8 per cent.
Shear fracture of 45 degrees.
Brinell hardness—196, checked on four tests.

This steel may be furnished in the form of plates, shapes, bar stock, and tubes. It is an open-hearth steel and requires no special process for melting other than the addition of the small amount of alloys making up its composition. Standard practice is followed in casting and rolling. It may be furnished in standard structural shapes to meet present detail methods of fabrica-

Physical Properties of Various Structural Steels

Type of steel and heat treatment	Carbon per cent	Pounds per square inch 000 omitted: Yield point	Ultimate strength	Elongation per cent in 2 inches*	Reduction of area per cent
Chromium-manganese silicon					
As-rolled or normalized	0.20	60	90	28	62
As-rolled or normalized	0.30	70	115	25	60
As-rolled or normalized	0.40	90	140	20	50
Silicon-manganese					
As-rolled	0.30	65	110	25	52
Normalized	0.30	70	100	28	60
Manganese, 1.50 per cent manganese					
As-rolled	0.30	60	95	24	55
Normalized	0.30	60	95	28	60
Silicon, 0.40 per cent silicon					
As-rolled	0.30	50	90	22	50
Structural steel					
As-rolled	0.25	38	65	24	45

*Mass effect approximating 1-inch round stock.

tion. Because of its good welding properties the steel affords the designer the opportunity of modifying present detail design and saving weight by doing more welding and less riveting. With a given weight of steel for construction, welding permits the steel to be placed where it will be most effective. The proper placing of chromium-manganese-silicon steel in welded construction enables the designer to save considerable weight.

The steel should be suitable for construction of boilers and pressure vessels. The A. S. M. E. boiler code committee has had considerable discussion regarding the allowable working stresses of steel plate for boiler and pressure vessels, and has resisted attempts to raise the tensile strength of ordinary carbon steels and has taken the position of preferring safety to economy or lightness. Attempts to raise the carbon content or otherwise change the chemical characteristics have been found to detract from the desirable physical qualities of plain carbon steel for boilers. Up to the present time we understand the boiler code committee has not desired to change its present safety factor of five for stationary steam boilers, based on the minimum tensile strength of the steel. It would appear that chromium-manganese-silicon steel is a satisfactory material, since it offers an increase in tensile strength and higher elastic limit, without modifying other desirable physical qualities for boiler and pressure vessel construction.

Salt water corrosion is another problem in marine construction. One grade of noncorroding steel containing 18 per cent chromium and another grade containing 18 per cent chromium and 8 per cent nickel offer good resistance to salt water corrosion and can be used beneficially in many instances where corrosion is acute. The latter grade has been used successfully for tanks, cable and marine hardware, and has been suggested for fire mains and other parts that cannot be protected from the destructive action of salt water. Corrosion resistance is a most valuable property where equipment is difficult or costly to replace.

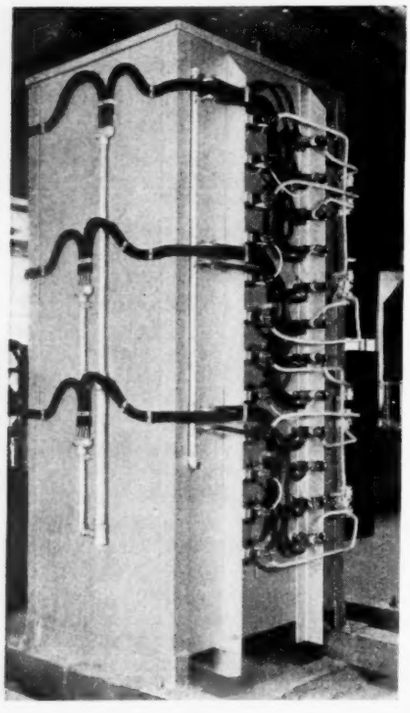
Resistance Is Measured

Tests performed by Sir Robert Hadfield and reported early in 1930 in the *Journal of the Society of Chemical Industry*, indicate the corrosion resistance of the alloy steels. Test pieces were totally immersed in sea water during a period of 12 months, with the water changed every 14 days. An ordinary 0.15 per cent carbon steel showed a loss of 2.8 grams per 100 square centimeters of surface exposed; an 18-8 chrome-nickel steel showed a loss under the same conditions of only 0.04 grams; while a 36 per cent nickel, 14 per cent chromium steel showed a loss of only 0.02 grams. If this test had been prolonged the showing would have been even more favorable for the alloy steels, since the protective coat formed on their surfaces would offer greater resistance to further corrosion.

Large size steel forgings containing 13 to 18 per cent chromium have been used for marine work, such as tail shafts and pintles, where combined strength and resistance to salt water corrosion are required. The following good physical properties may be obtained in forgings made of corrosion-resisting steel: Tensile strength of 165,000 pounds per square inch; elastic limit of 135,000 pounds per square inch; proof stress at 80,000 pounds per square inch; elongation in 2 inches of 12 per cent; and reduction of area, 40 per cent. Large ingots from 24 to 30 inches in diameter have been made from steel of this grade.

Marine engineers frequently object to the use of corrosion-resisting steel because of its high cost, without giving due consideration to the resulting saving in repairs, maintenance, and depreciation. At one time, this same objection was raised by the chemical and dairy industries, but when the saving in the cost of repairs and maintenance was taken into account, the initial expense of the steel could be justified readily. Similar conditions probably exist in marine construction.

Development work is being done by steel companies and alloy manufacturers to find a rust-resisting steel suitable for ship plates, which will cost less than rustless steel and slightly more than carbon steel. Elaborate tests are now under way to determine the resistance of various kinds of alloy steel to sea water.



ELECTRIC FURNACE FOR SOVIET: High-speed 100-kilowatt broach hardening furnace built by American Electric Furnace Co., Boston, for Autostroy plant in soviet Russia. The working chamber of the furnace is 8 inches wide, 12 inches long and 72 inches deep, heated by 24 Globar-type electric heating elements, horizontally mounted on two sides of the chamber. All terminal sockets are cooled by continuous circulation of water through them, each water circuit having a visible drain to check operation of the system. A notable feature of the furnace is a patented type of atmospheric control which prevents scaling of the work when being heated

Develops New Corrosion Resisting Alloy

A new nickel-base alloy low in iron and containing chromium and combining strength and resistance to corrosion with facility of manufacture has been introduced by the International Nickel Co., New York. This alloy, designated as "Inco Chrome Nickel," was developed particularly for the manufacture of dairy machinery and is available in the form of sheets, bars, tubes and castings.

A long series of tests is said to have shown that under constant exposure in the high acid conditions of a buttermilk machine, 16-gage sheet of the material would lose less than half its thickness in 300 years. The alloy can be fabricated according to present methods, including electric and oxy-acetylene welding, brazing and soldering.

Announcement of the alloy represents a new step for the International Nickel Co. which for some years has limited its materials in the dairy field to pure nickel and monel metal.

Would Expand Hoist Sales

H. R. Butler, Richards-Wilcox Mfg. Co., New York, addressed members of the Electric Hoist Manufacturers' association in New York Nov. 19 on the subject of opportunity for expanding sales of hoists and monorails. The next meeting of the association will be in January.

New Code for Fusion Welding Likely To Be Misapplied

BY F. G. SHERBONDY

WITH adoption in 1931 of the A.S.M.E. fusion welding code for unfired pressure vessels, authorities have placed a stamp of approval on the relatively new method of construction. By its very nature, however, the code may present confusing problems of classification and interpretation and some of these difficulties are discussed in the accompanying article. The author, F. G. Sherbondy, is vice president and treasurer, Biggs Boiler Works Co., Akron, O.

THE advance which has taken place in the art of fusion welding in the last few years probably never has been paralleled by a similar development so materially affecting recognized and accepted practices of long standing. Universal approval has been accorded welded construction, after what may seem a relatively short period of research and development. The author believes this approval has been due chiefly to three major conditions.

First: For a long time there has been a genuine need for a method of constructing various types of retorts, vessels and other equipment used by the process industries, a method which would give a superior product. Advantages of electrically welded construction were recognized readily and received by industries in general as a means of effectively and more economically carying out many advanced processing requirements.

Second: The thoroughness with which various fabricators of special steel and alloy plate construction attacked the problem of working out individual welding procedures which would control, within close limits, the many variables encountered, with the object of producing welded joints of a predetermined uniformity and definite strength.

Unification of Methods

Third: The co-operation of various organizations such as insurance companies, societies and committees interested in the project and the painstaking and laborious task of unifying the many and various methods of welding employed by individual manufacturers into a universal code to be accepted and approved by the various interests.

Rules for the construction of unfired pressure vessels as adopted by the American Society of Mechanical Engineers code committee on July 7, 1931, place the stamp of approval of the highest engineering authorities on welded construction and effect a universal recognition of this method without commercial limitations.

It is to be expected that the 1931 code, permitting as it does construction without limitation of any type of pressure vessel, may present problems of both classification and interpretation which are not always understood by the management of industries in general. Being the result of research and data supplied from so many different sources, the code may contain conditions, which when combined under a uniform procedure are likely to be misunderstood and misapplied.

Proper interpretation of the three classes of welding permitted in the code is essential to the industrial engineer preparing specifications for the construction of welded vessels, as well as to the management of industry in general. The author would like to point to a feature that is of paramount importance, namely, that the classification of the accepted methods of welding in the 1931 code, under Classes 1, 2 and 3, is to be considered solely as "a method of describing the recognized and accepted practices for welded construction" and not as a means of qualifying or grading respective types or methods of welding as to their superiority one over the other.

Results of Extensive Research

For example, certain definite types of vessels, or to be more exact, vessels of certain dimensions and for certain working conditions and pressures, are to be built under Class 1, certain other types of vessels are to be built in conformity with Class 2, and certain other types are to be built in conformity with Class 3 welding. These various classifications are the result of several years of painstaking research, countless tests and a collection of countless volumes of data covering the entire subject of welded vessel construction. From these efforts the classification referred to has developed, with the result that each class is distinctly within itself and is the recognized and accepted standard of construction for vessels of the type which fall into the respective classes.

A tendency may exist for some engineers, who are responsible for the successful operation of various individual processing units, to place a capital burden on the management by not analyzing thoroughly the full meaning of the new code, and by arbitrarily specifying a type of construction, entirely unnecessary for the particular type of vessels under consideration, feeling that in so doing they have played safe and relieved themselves of any individual responsibility. This theory, fortunately, is not often encountered, especially when dealing with engineers who are thoroughly conversant with welded construction and the details of code requirements.

Occasional Poor Judgment

However there does exist in the mind of an occasional engineer the feeling that to be on the safe side he must specify Class 1 construction, irrespective of conditions of service his individual unit is to operate under, whereas as a matter of fact Class 2 or possibly Class 3 construction would in all probability give him a higher degree of safety than he has ever enjoyed before on similar plant apparatus.

It is needless to say that such a policy is economically wrong and this type of engineer is not being fair with his management or to his profession.

The author doubts if any one subject which the code committee had to consider aroused more discussion than the specifications dealing with stress relieving. Space does not permit details with reference to various arguments pro and con on the subject. Perhaps it is sufficient to say that if a theory exists that thermal stress relieving is a cure-all for all welding ills, the feature is much over-rated and its benefits are much misunderstood.

Stress relieving, like many other requirements of the specifictions, is to be recognized as an important factor. Construction of vessels free from measurable or objectionable stresses is as essential as good ductility, uniformity and strength. However, the specifications applying to stress relieving of Class 1 vessels and to a limited extent to Class 2 vessels are the result of a compromise from the original thoughts on the subject, the compromise being effected undoubtedly by the favorable experience records of products of certain welding procedures, wherein thermal stress relieving was not employed.

Thermal stress relieving, as required by the code, does not nor was its function ever intended to improve the tensile strength, ductility or

soundness of the weld. Its application in the code is due largely to a broad interpretation of welding, on account of the fact that individual ability or procedures cannot be recognized. Thermal stress relieving on vessels of extremely heavy wall thickness, however, undoubtedly is a good practice, if not an essential requirement.

It has been the experience of the company with which the author is associated any many others, on vessels constructed of plates up to 1½ inch in thickness, that thermal stress relieving is unnecessary and is regarded as an economical waste. This contention is shared by leading insurance companies who have had a background of several years' experience with vessels built under such welding procedures. On the other hand, it is possible that other welding procedures may lock up stresses which must be thermally relieved, therefore the rules adopted by the code committee are entirely justifiable. In no case, however, should thermal stress relieving be considered necessary in the production of welded vessels beyond the code requirements, or if employed, such vessels should not be considered superior to vessels constructed under a procedure wherein the procedure itself is so controlled that measurable stresses are not originally setup.

It should be the object of every manufacturer of welded pressure vessels to protect his investment as well as the position that has been accorded welded construction, by demanding constantly the full and complete observance of the fundamentals of good welding. It should likewise be the duty of industries in purchasing welded equipment to inquire into the individual ability of the manufacturer, his experience and record of performance. The buyer should further earnestly consider the type of service in which the vessels under consideration are to be used and be guided by the proper interpretation of the A. S. M. E. code as to specifications.

Look to Fundamentals

For several years our company has been manufacturing electrically welded high-pressure vessels for the various process industries and continuous and satisfactory operation of these units prompts the author to say it is essential that this type of construction must not be unduly handicapped by improper application of fundamentals.

In the author's opinion, fusion welded construction is superior to other types of construction, but its merits must be judged on the basis of ultimate cost and not on initial cost. In some instances, welded vessels may have a slightly lower initial cost because of a saving in material, but this is not always so. The real saving is effected through decreased maintenance, general utility and prevention of loss in production due to repairs. Ultimate cost, therefore, is favorable to welded construction.

Motors and Control for Rolling Cold Strip

(*Concluded from Page* 32)

isfactory for rolling Class II strip.

On the other hand, adjustable potential control provides smooth simultaneous acceleration or deceleration of all stands, maintaining the same relative speeds of the various stands at all times. This is true whether the mill is accelerated from standstill to running speed; or, from threading to running speed. Threading speed, of course, is obtained by reducing the generator voltage to the desired low values through the automatic generator-field control.

The purpose of the reel, general operation and reason for constant tension already have been explained in the discussion of reel motors. The more comprehensive reel, which is used most extensively at the present time, is one on which the jaws are locked automatically and the drum is expanded automatically. The drum is not fastened rigidly to the driving shaft, but is connected by toggles, these toggles being so arranged that the jaws will lock and the drum will expand when the drum is held back and the driving shaft is rotated. A band brake, operated by a foot pedal, therefore, is used on the drum for restraining it until the slack in the strip is taken up, the strip itself furnishing the restraining force. As soon as the end of the piece leaves the mill, the restraining force disappears, causing the drum to collapse and the jaws to unlock. With this type of reel, it is evident that tension on the strip must be maintained at all times after the rolling operation is started.

Two methods of threading or starting the winding operation are used and the control is usually arranged so that either method may be employed. One is known as the "on-the-fly" method and the other as "from-standstill" method.

The on-the-fly method consists simply of allowing the mill to run while the reel is being threaded. The operator catches the end of the strip as it leaves the mill, walks up to reel, inserts it in the reel jaws, steps on the foot pedal which applies the band brake, and at the same time starts the reel through a switch connected to the pedal. To take up the slack strip, the reel must accelerate to a speed slightly above the delivery speed of the mill. It is desirable to take up the slack as soon as possible so there will be no loose wraps on the reel drum. The first few turns, if allowed to be loose, are apt to bind and to wrinkle when the strip comes under tension, making an uneven coil. The motor is slowed down momentarily just before the slack is taken up to prevent snapping the strip.

This method is employed when the strip is narrow and of such gage that it can be handled easily. It is essential to get the strip straight in the jaws, for otherwise it tends to wrap tight on one side and loose on the other, causing wrinkles and a tension which is not uniform across the strip. Difficulties in threading, of course, depend largely upon the threading speed. Thus on an adjustable potential controlled mill having a slow threading speed, almost any strip may be threaded on the fly because the operator has plenty of time to adjust the end of the strip in the reel jaws before starting to reel. This method is especially desirable on tandem mills because the minimum amount of time lost in threading means increased production.

Mill Is Stopped

The from-standstill method consists essentially of threading through the mill a piece long enough to reach the reel, stopping the mill, engaging the end of the strip in the reel, starting the reel, allowing it to take up the slack and stall, and then accelerating both mill and reel simultaneously up to the running speed. In taking up the slack and stalling, the reel should run at a slow speed, for otherwise, its inertia will probably snap or stretch the strip.

In starting the mill and reel together, it is essential to have a means of setting the regulator to hold a higher value of current input to the reel because of the additional current necessary for accelerating. This should be taken care of automatically, of course, and arranged so that the regulator will hold the normal current for the proper tension after the period of acceleration is completed. This method of threading frequently is used in skin or finish rolling of Class II strip on single stands.

(*To be concluded in an early issue*)

Builds Four-High Mill Equipment for 50 Plants

Since the advent of the four-high mill method of rolling steel and nonferrous metals, the United Engineering & Foundry Co., Pittsburgh, has built equipment for this purpose for 50 plants. Seventeen plants now use four-high mill equipment for cold rolling of all kinds of commercial steels, 15 plants use it for hot rolling of sheets, strips and plates and 12 plants use it on nonferrous metals.

Six plants are using this equipment for stainless steel strips, one of the most difficult of rolling mill operations because of the extreme hardness of the material.

Steelmakers Aim at Economy Under Reduced Operation

WHILE the main task of steelmakers during recent months of depression has been to cut costs and maintain quality of product, the problem now confronting the industry is how to obtain the highest economy in the face of reduced operating rates. Until some improvement in the credit system becomes apparent, business conditions will undergo little change.

These observations were made by the chairman at the opening session of the fourteenth semiannual conference of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers in Detroit, Nov. 24-25. Shop and technical problems related to basic steelmaking practice were discussed in detail at this session with 106 open-hearth superintendents and others identified with the industry attending. The group inspected the Great Lakes steelworks of the National Steel Corp. on Tuesday afternoon.

Use of second-quality brick in checker chambers has not been found satisfactory by one superintendent who stated that the particular grade vitrifies and reduces furnace efficiency. However, according to an Illinois operator, use of this grade in checkers topped with four courses of silica brick permits reclamation of 80 per cent of the firebrick and affords satisfactory service without sagging.

Favor Silica Brick

Silica brick finds wide favor for facing bulkheads and magnesite brick for facing open-hearth ports, according to general opinion. One operator reported having obtained 400 heats on ports built of silica brick, faced with chrome brick and water cooled. Use of high alumina refractories in open-hearth ports and in the top courses of checkers was cited by a refractories producer. Various kinds of refractories are used in furnace bottoms. One superintendent mentioned that he uses a bottom comprising a 4-inch layer of insulated concrete, then a 6-inch layer of magnesite and portland cement and, finally, the regular bottom 12 inches thick and obtains better results than when clay brick is employed. Another producer cited a 3-year campaign with a bottom laid with two courses of clay brick and then three flat courses topped with 30,000 pounds of chrome ore set-in like magnesite.

As a move to increase capacity of some existing and rebuilt furnaces, when it is impossible to extend the hearth, the depth of the bottom has been enlarged by decreasing the amount of brick on the furnace pan. The operator making this statement also mentioned that the ideal bottom material is pure magnesium oxide and that the older the bottom becomes, the more the normal penetration of iron oxide lowers the fusion point. Any thermal calculation, therefore, should allow a sufficient safety factor to compensate for this condition.

Ladles now are made as shallow as possible to avoid splashing from too great a head, the cross sections even being made elliptical to fit existing crane bales and ladle stands, while increasing capacity. This was brought out in the report on pit practice. Nozzles have become lengthened to give a shallower bell and to prevent spraying the stream in ladles with greater metal head. A number of plants are using nozzles 12 inches and longer, the report disclosed. Shapes other than round for the hole through the nozzles are being used to prevent splashing and have been found helpful by a number of operators.

Graphite Mold Wash

To obtain best results from use of a graphite mold wash, a speaker emphasized that a product of uniform purity is essential. An extremely fine pulverized graphite is more desirable than a flake or crystalline grade because of its adhesive quality. When the graphite is sprayed, he declared, it is desirable that the mixture in the tank be kept agitated because graphite, being insoluble in water, has a tendency to precipitate. When preparing dry powdered graphite for application it is good practice, he contended, to mix the graphite with water to a paste consistency to eliminate lumps. When a supply is prepared in this manner, it can be reduced to the proper consistency for application. From observation, a mixture of three parts water to one part graphite seems to be satisfactory with mold temperatures around 120 degrees Fahr.

Radius of mold corners is controlled by experience and actual observation in steel plants more than by pouring over a drafting board, according to the comments of a mold maker. Molds that have heavy walls or a rather high ratio of mold to ingot are better for both ingot and mold, he declared. In discussing the relation of mold height to its cross sectional area, he said a good general rule to follow is: The higher the quality of ingot, the shorter the mold. The cross sectional shape of molds, he explained, is dictated by the product to be made.

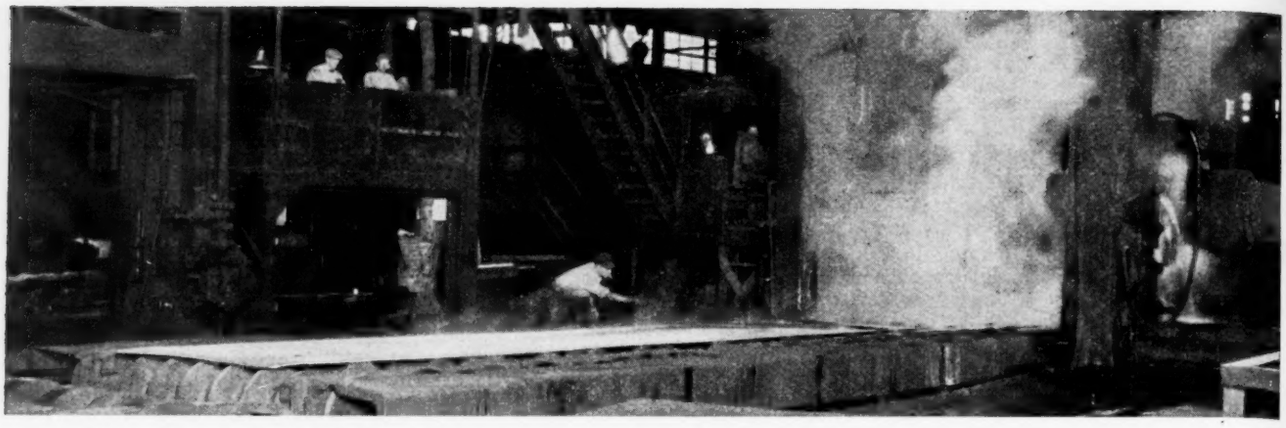
In discussing merits of pouring steel from a ladle equipped with two nozzles one operator mentioned that the heat is tapped at a temperature of 2950 degrees Fahr. and is held in the ladle for 10 minutes before pouring. Using two nozzles a 135-ton heat is poured in 29 minutes, compared with 70 minutes through a single 1¾-inch nozzle.

Produce Bankable Steel

Rolling schedules can be balanced best if the open hearth is allowed an ample number of fallen-down heats and if a proportion of bankable steel is included in the schedule, according to the chairman of the organization committee. Providing no burnout of open-hearth gas flues is necessary, quality and mill delay can be met best through continuous operation of furnaces. The shut down period of the rolling mills is utilized readily by the open hearth in producing bankable steel which later in the week can be drawn upon to meet what otherwise would be costly mill delays. In other words, he pointed out, a backlog of banked ingots becomes a distinct aid in scheduling efficient operation in mills and hinges on the variety of available orders. Each plant, he concluded, is a problem in itself in that so much depends on the grades of metal made, the cost of metal charged, type of fuel used and orders that are available.

That considerable variation exists in the ratio between the arch spring and the span of open-hearth roofs was brought out by the chairman of the furnace construction committee. Variation in the ratio of rise per foot of span show from 1.22 to 1.63 inches. Where a considerable quantity of light bulk scrap is charged it may be found advantageous, he stated, to increase the rise, thus allowing more space for combustion and gas travel during the charging and melt-down periods. In discussing the use of secondary regenerators in the flues, the speaker mentioned that the air preheat can be calculated from the heat transfer. The installation of such auxiliary chambers has shown an increase in the combined preheat of primary and secondary regenerators amounting to 11.7 per cent. From results obtained in several plants and from theoretical calculations, he stated each 100-degree increase in the air preheat temperatures, gives about 4 per cent increase in production of steel and 4 per cent decrease in fuel consumption.

(To be continued next week)



PROGRESS IN STEELMAKING

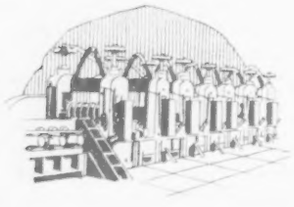
WHEN order books of a large steel maker in the Pittsburgh district only justify 35 to 40 per cent engagement of rolling equipment the open-hearth department is operated until a bank of 60,000 tons of ingots has been accumulated. The furnaces then are put on gas until the ingot bank is exhausted when charging and melting again are resumed. This practice, when the cloak of dullness is spread over the market, is keeping the company's ingot costs on the right side of the ledger.

♦ ♦ ♦

A device, known in radio engineering as the Dowling ultra-micrometer, which comprises two oscillating circuits of different frequencies, is being applied to the measurement and classification of steel sheets, differences in thickness as small as 0.00025-inch being detected.

♦ ♦ ♦

Freewheeling recently has been adapted to 4-high cold strip mills. On a mill recently installed in an Ohio plant the first stand of the mill train is equipped with a set of 8½-inch feed rolls which are chain driven from the spindle driving one of the work rolls. Once the strip is in the grip of the work rolls the feed rolls merely serve as idlers.



A RECENT series of power consumption tests conducted by an Ohio steelmaker on a 2 and 3-high bar mill with the rolls mounted in both plain and roller bearings, demonstrated that mills equipped with antifriction bearings require from 64 to 93 per cent less power than plain bearing mills.

♦ ♦ ♦

The recently introduced thrustor, a device which produces a straight-line constant-pressure thrust from a motor drive, has been applied to the delivery table of an automatic punch press. The sheets, ejected from the press, strike a limit switch on the discharge table. This energizes the thrustor which, with a vertical upstroke, causes a lever to engage the punched sheet and pull it from the press. When the sheet reaches the limit of travel, it strikes a mechanical lever stop, which automatically drops the piece on the pile below. The thrustor then returns to its starting position. Formerly the punched steel sheets were piled by hand.

A NORMAL taper of 3 inches has been found adequate for a 20-inch ingot mold of the big-end-up type and 65 inches long for pouring the usual grades of carbon and alloy steel, according to the practice of one maker.

♦ ♦ ♦

Radical departure in the design of doors for annealing and heating furnaces is apparent. To lighten the weight, refractory brick now are being replaced by high-temperature insulating brick with a thin air-setting coat of refractory cement brushed on the high-temperature side of the brick.

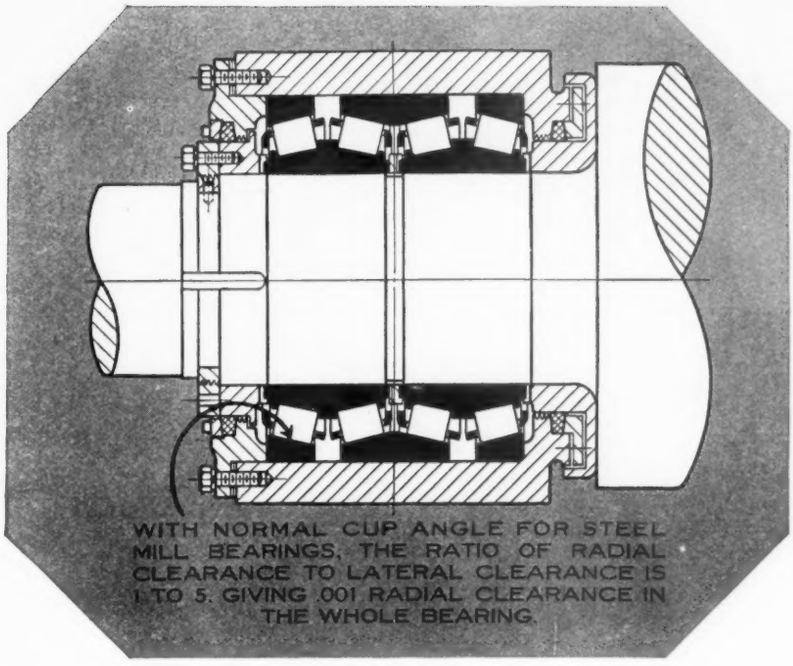
♦ ♦ ♦

A recent improvement in the method of handling tin mill scrap from the squaring shears to the baling press has effected a saving of 25 cents a ton in the handling charges at a mill in the Pittsburgh district. Under the former system of handling a workman would collect the loose trimmings at the rear of the hot mill squaring shear, wire them in loose bundles and load them in a container. The waste material then was transferred by crane to the scrap baling station and dumped on a platform. Under the new system, however, the shears are turned parallel to the hot mill train; all side and end shearings drop by gravity into a box placed in a pit in the aisleway. To promote an orderly deposition of the trimmings in the container each shear is equipped at the rear with a pan which receives the shearings parallel to the knife. When a sufficient quantity has accumulated the pan is counterbalanced to permit the scrap to be deposited by gravity in the box in an orderly arranged pile. The crane then transfers the loaded boxes to the baling department as before, but all shear-attending labor is released for other duties around the plant.

♦ ♦ ♦

Handling heavy coils of strip at the front and rear of a train of 4-high cold strip mills recently installed in an Ohio plant, is accomplished by 2-ton jib cranes.

A STEELMAKER in the Chicago district recently adopted the practice of controlling the percentage of the six important chemical constituents, namely carbon, silicon, manganese, sulphur, phosphorus and iron in all open-hearth heats.



WITH NORMAL CUP ANGLE FOR STEEL MILL BEARINGS, THE RATIO OF RADIAL CLEARANCE TO LATERAL CLEARANCE IS 1 TO 5, GIVING .001 RADIAL CLEARANCE IN THE WHOLE BEARING.

Simplify your roll neck mounting by using Timken Bearings

With Timken Bearings on roll necks, no auxiliary supports, such as thrust bearings or thrust collars are needed. The Timken Bearing is geometrically designed to carry *all thrust loads* and *all radial loads* within itself.

The Timken Tapered Roller Bearing is the only type of bearing that can be set up with extremely close radial running clearances, and maintained in that condition during its entire life. That means *any clearance*, from zero to the exact amount required for the accurate rolling of any product—bars, rounds, sheets, strips, etc. The geometry of the bearing, as shown in the illustration, makes this fact obvious.

The wear that occurs in a Timken Bearing during operation, does not necessitate take-up any more frequently than a "non take-up" bearing has to be replaced. Thus the life of the Timken Bearing is much longer. This extended life represents years of added service... many extra tons rolled... uninterrupted operation... and thousands more dollars in profits. Timkens can be applied to your present mill equipment. Write for complete information.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**

Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

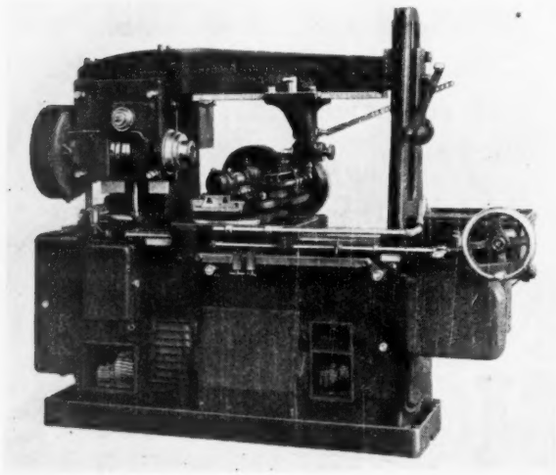
Hobbing Machine Embodies New Design Features

Barber-Colman Co., Rockford, Ill., recently developed a new hobbing machine in which the bed and upright are of heavy ribbed box section with ample bearing surfaces for the work spindle and hob spindle slides. Gear storage boxes are cast integral as shown in the accompanying illustration. Work arbors are supported at the outer end by an overarm bracket or tailstock, sliding on dovetail ways, which is provided with a clamp handle and a rapid unloading device, so that the bracket can be quickly released and moved out of the way when the work arbor load is being changed.

Indexing of this machine is performed by a worm and worm gear mounted in a case on the work spindle slide. Improved features of design include means for adjusting for wear between the worm and worm gear in order to maintain maximum accuracy of indexing. The gear guard case is mounted on a horizontal slide in such a manner that it may be moved by adjusting screws.

The hob swivel slide is moved longitudinally by an accurately threaded steel feed screw in the bed of the machine. This feed screw is driven from the feed box at the right hand end of the machine and can be revolved in either direction at the normal working speed or for rapid traverse. A hand wheel also is provided for manual movement of the hob swivel slide assembly. The machine is equipped with an automatic stabilizer built into the bed and arranged to give a steady frictional drag or resistance to the hob swivel slide so that the hob will move steadily forward without jump or chatter. The stabilizer may be disconnected when desired by pulling out a small knob on the front of the bed casting.

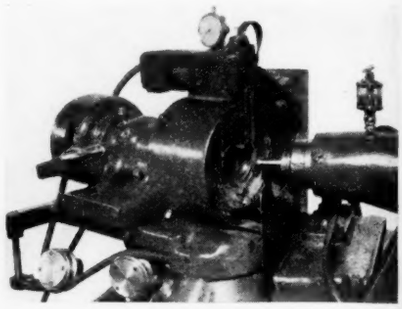
Gears for changing the speed of the machine are mounted on the front of the bed and protected by a hinged cast iron guard. A combination of automatic stops is provided so that the machine may be set for almost any desired series of operations. Stops on both feed and rapid traverse mechanisms are provided and there is another stop which automatically throws out the clutch on the main drive at the end of the cut. The machine is of the constant speed drive type and is driven by a 5-horsepower, 1750 revolutions per minute motor, adjustably mounted in the base of the machine under the upright.



HOBBING machine of constant speed drive type built by Barber - Colman is driven by a 5 horsepower motor, adjustably mounted in the base of the machine under the upright. The unit is equipped with a combination of automatic stops

Ball Race Grinder Equipped With Sizing Device

Landis Tool Co., Waynesboro, Pa., has announced the development of a ball race grinder completely motorized and equipped with a sizing device. The unit is designed to grind outer ball race grooves on a high production basis. It also may be used to grind inner ball race grooves and for certain other types of miscellaneous radial grinding.



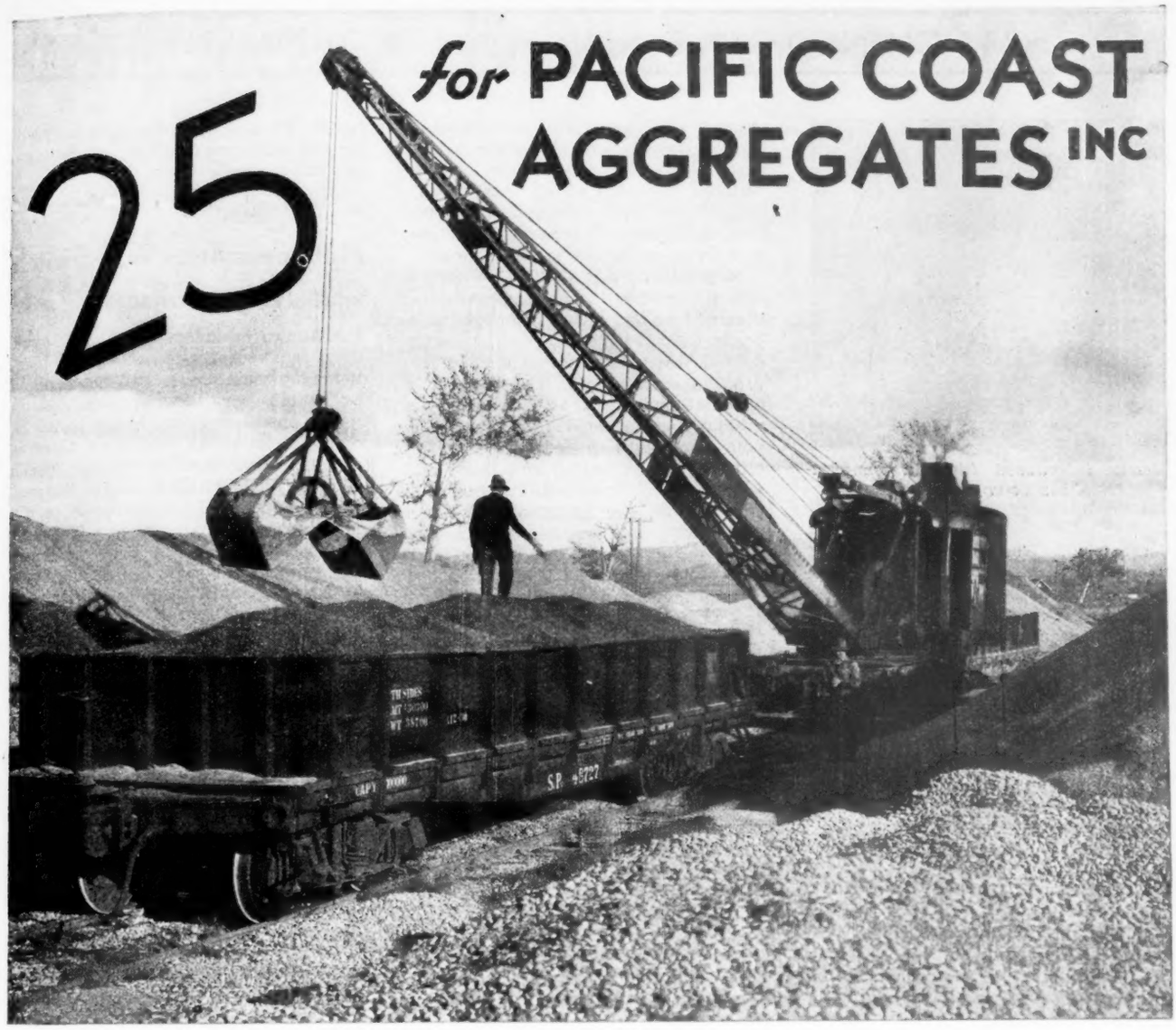
Landis ball race grinder which is completely motorized

Operation is, in a sense, semiautomatic. After loading the work and swinging the sizing device around to its operating position, the operator moves the wheel into the work and starts grinding. The automatic wheel feed mechanism feeds the wheel in steadily from this point, advancing it a predetermined amount twice within the space of one oscillating movement.

When the raceway is almost down to size the automatic wheel feed mechanism is disengaged by means of a solenoid controlled by the sizing device. Remaining stock is quickly removed without further feeding in of the wheel and as soon as the raceway is down to exact size the wheel moves back a few thousandths from the work. This also takes place automatically, being controlled by a solenoid which is actuated by the sizing device. The operator gives the feed up hand wheel an approximate half turn clockwise, moves the wheel away from the work and reloads.

Oscillation Is Automatic

The work carrying head is automatic in its oscillation. It is provided with adjustments for varying the length of the arc of oscillation. A unique driving arrangement is used for the work head spindle. The vertical oscillating spindle is hollow and extending through it is a driving shaft. A grooved pulley at the top of the driving shaft transmits the power to the left-hand end of the work spindle by means of a round



East, west, north or south—in all parts of the country, Industrial Brownhoist cranes are the choice of the large companies. For example, Pacific Coast Aggregates, Inc., one of the west's biggest sand and gravel producers, has purchased twenty-five.

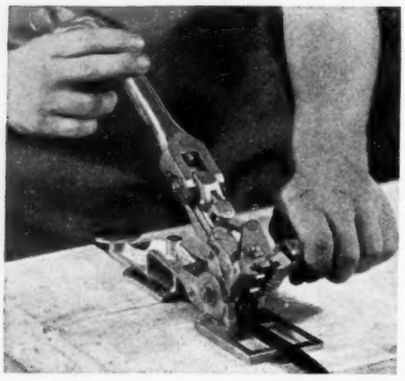
Why are Industrial Brownhoists preferred by successful concerns—why do they invariably buy one after another? Simply because these companies weigh values carefully and know that Industrial Brownhoist locomotive and crawler cranes handle materials at the lowest cost.

A good locomotive or crawler crane will show the same savings on your work as it does for thousands of others and will handle all kinds of materials. Our nearby representative can tell you in a few minutes how you can profitably use an Industrial Brownhoist. Why not call him in?

Industrial Brownhoist Corporation, General Offices, Cleveland, Ohio

District Offices: New York, Philadelphia, Pittsburgh, Detroit, Chicago, New Orleans, San Francisco, Cleveland.

INDUSTRIAL BROWNHOIST



Newly introduced Signode combination box strapping machine

leather belt. The work holding chuck is not furnished as a part of standard equipment but the lever-operated, three-finger, spring-loaded type shown in the accompanying illustration, is typical. A 2 horsepower constant speed motor mounted at the rear of the bed drives the entire machine.

◆

Combination Unit Expedites Strapping of Boxes

Signode Steel Strapping Co., 2600 North Western avenue, Chicago, recently introduced a new machine which simplifies and speeds up strapping of all types of shipping containers. It performs work which formerly required two tools. Several short strokes of the tensioning handle tightens the strap, after which the colored trademark seal is snapped on and the sealing handle pressed forward sharply to lock and seal the strap. The accompanying illustration shows the machine in the process of securing a steel strap.

The fact that both operations are performed by one machine makes for more uniform tension and assures better sealing which of course is essential to safe shipping. In recent years the use of tensional steel strapping for practically all shipping purposes has increased. In view of this the new combination strapping machine should find wide application.

◆

Across-the-Line Starter Is Totally Enclosed

Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland, recently introduced a new across-the-line motor starter designated No. 2, type ZO. It is a self-contained unit, totally enclosed in a heavy (16 gage) pressed steel case with oil-immersed main and control circuit contacts and vapor-proof overload relays. These features of design which also include compactness and dust-tight construction, make the unit safe for operation in adverse atmospheric conditions.

In designing this starter, a view of which is shown in the accompanying illustration, there was incorporated a 3-pole E-shaped magnet, on the center pole of which is mounted a moisture-proof, operating coil. The upper pole of this magnet is half shaded, the middle pole not shaded and the lower pole completely shaded. This design eliminates chattering and hum and produces a uniform pull on the armature due to two additional fluxes of different phase angles superimposed upon and out of phase with the main flux produced by the line current.

Two thermal type overhead relays are used in this starter to protect

Across-the-line starter built by Electric Controller & Mfg. Co.

motors against single phase and overload conditions. The starters are tested and shipped with overload relays set to trip at 125 per cent of full load motor current. When desired, however, this setting may be easily changed to any value between 100 and 150 per cent by turning a small knob located on the outside of the relay cover. This new starter may be used for low voltage release or low voltage protection applications.

◆

Automatic Two-Way Switch Conveys Hot Sheets

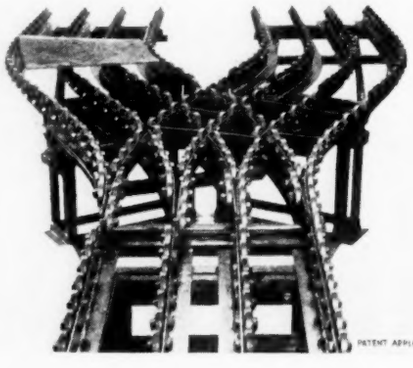
Mathews Conveyer Co., Ellwood City, Pa., recently placed on the market a new automatic two-day conveyor switch for use in steel plants where operations require the handling of hot sheet packs from both sides of a continuous furnace. Sheet packs are handled without being jammed and are delivered automatically to the mill in accurate alignment. The new switch is made up of a heavy structural steel frame, rigidly welded into a complete unit, and on which are mounted wheels for conveying the load. The accompanying illustration shows the switching mechanism.

Wheels used are 4 inches in diameter, bored for a ¾-inch bolt, and have 15/16-inch riding faces, with two thicknesses of heavy gage steel for riding tread. They are ball bearing wheels with a continuous load rating of 300 pounds; all bearing parts are hardened steel, including the 12 ⅜-inch diameter steel balls and the inner and outer ball races.

Methods of Operation Diversified

Pivoted switch sections are arranged to raise or lower automatically and alternately so as to receive sheet packs from either side of the furnace. The switch can be operated by remote control in several ways—by a standard motor, coupling connected, worm gear reducer and chain drive, or through electric or pneumatic operators. It also can be controlled by hand, since one attendant easily can operate the switching mechanism to meet the discharge rate of sheet packs from the furnace. This mechanism is designed to meet various conditions, the number of rows of wheels depending entirely on the size and shape of the article to be conveyed.

HOT sheet packs from both sides of a continuous furnace are handled by this new two-way conveyor switch designed by Mathews Conveyer Co. The structural frame is fabricated into a unit by welding



Constructive Developments Persist

Markets Disclose Larger Requirements, Though Operations Off To 29-30 Per Cent—Automotive Orders Heavier—Prices Display Mixed Trend

NUMEROUS constructive developments are discernible in the structural shape, reinforcing bar, steel pipe, railroad and automotive markets, which tend to sustain steelmakers' confidence in the first quarter, and an encouraging number of specific requirements are maturing and fresh inquiry developing.

Nevertheless, sentiment concerning business in December has been vitiated noticeably in the past few days by exterior unfavorable developments, particularly the deterioration of prices of grains and securities. For the present, at least, steel has lost considerable buoyancy.

The course of steelmaking operations since mid-October reveals a lack of underlying vitality. From 27 per cent, operations rose to 31 per cent by the week ended Nov. 14. After wavering for several days, the upward march was resumed early last week, but toward the end of the week a lack of recuperative power was evident and a weekly average of 29-30 per cent barely maintained. For the current week the rate probably will be unchanged.

Considering the constructive developments emanating from Washington recently, the increasing softness in steel prices, which in some products approaches demoralization, is discouraging. Steel shapes and plates are now 1.50c to 1.60c, base, Pittsburgh, a downward spread of $2 a ton. Strip steel has been shaded to automotive consumers. Discounts on bolts and nuts have been increased. Cold finished bars are easier, as are foreign and eastern iron ores.

Enameling stock has been reduced $3 per ton, though on other sheet grades some makers have extended current prices into the first quarter. Pittsburgh mills plan to advance wire rods and wire products for the first quarter. In some quarters an announcement stabilizing steel bar, plate and shape prices for the first quarter is expected as a sequel to current unsettlement.

Automotive steel requirements are expanding slowly. Ford has made a few moderate-size purchases, has taken prices on considerable tonnage, but has not definitely covered for a production run of his new model, although this may be expected any time. Chevrolet, Chrysler and Studebaker have issued blanket inquiries for the first quarter. Minimum dealer stock requirements of 1932 models are expected to lift December production to 125,000 units or more, entailing the consumption of several hundred thousand tons of steel.

After declining four consecutive weeks, structural shape awards show a substantial revival, awards for the week amounting to 24,459 tons, including 4900 tons for the Supreme Court building, Washington. Bids close Dec. 11 on 11,465 tons for New York's west side elevated highway; new inquiry in New York on which definite closing dates have been set exceeds 20,000 tons. Featuring the reinforcing bar market is one of the largest single orders ever placed, for Radio City, New York, estimated at this stage of the plans as many thousands of tons.

In pipe the most promising is a project at Chicago for building a line from Montana to that city to transport grain, which when it matures will require a heavy tonnage. The Argentine government is in the market for 8000 tons.

Recent rail releases at Chicago have reduced the carryover on this year's contracts, and some new orders for early 1932 rolling are nearing the active point. Northern Pacific will buy, instead of build in its own shops, as it previously planned, 150 hoppers.

STEEL's iron and steel price composite this week is down 8 cents to $30.55; the finished steel composite is off 20 cents to $48.02, while the steelworks scrap composite remains $8.19.

Composite Market Averages

	Nov. 28	Nov. 21	One Month Ago (Oct., 1931)	Three Months Ago (Aug., 1931)	One Year Ago (Nov., 1930)	Ten Years Ago (Nov., 1921)
Iron and Steel Composite	$30.55	$30.63	$30.74	$31.05	$31.92	$34.71
Finished Steel Composite	48.02	48.22	48.22	48.72	49.62	53.69
Steelworks Scrap Composite	8.19	8.19	8.50	8.79	11.17	11.91

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. **Finished Steel Composite:**—Plates, shapes, bars, hot strip, nails, tin plate, pipe. **Steelworks Scrap Composite:**—Melting steel, compressed sheets.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Nov. 28, 1931	Oct., 1931	Aug., 1931	Nov., 1930
PIG IRON				
Bessemer, del. Pittsburgh	$17.76	18.16	18.26	18.76
Basic, valley	15.00	16.50	17.00	17.00
Basic, eastern del. eastern Pa.	16.00	16.00	16.75	17.50
No. 2 foundry, del. Pittsburgh	17.76	18.16	18.26	18.26
No. 2 foundry, Chicago	17.00	17.20	17.50	17.50
*Southern No. 2, Birmingham	12.00	12.00	12.00	14.00
**No. 2X, Virginia furnace	18.00	18.00	18.25	18.25
**No. 2X, Eastern del., Phila.	16.01	17.01	17.51	19.26
Malleable, valley	16.50	16.90	17.00	17.50
Malleable, Chicago	17.00	17.10	17.50	17.50
Lake Superior, charcoal, del. Chi.	25.04	25.04	27.04	27.04
Gray forge, del. Pittsburgh	17.13	17.53	17.63	17.63
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	103.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $11, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.35	2.40	2.40	2.55
Connellsville foundry, ovens	3.25	3.25	3.25	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	29.00	29.00	29.00	31.00
Sheet bars, open-hearth, Pitts.	29.00	29.00	29.00	31.00
Billets, open-hearth, Pittsburgh	29.00	29.00	29.00	31.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00

	Nov. 28, 1931	Oct., 1931	Aug., 1931	Nov., 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.89	1.89	1.89	1.89
Iron bars, Chicago	1.65	1.70	1.70	1.70
Shapes, Pittsburgh	1.50	1.60	1.60	1.60
Shapes, Philadelphia	1.69½	1.76	1.76	1.71
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Philadelphia	1.73½	1.80½	1.80½	1.80½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.85	1.85	1.85	1.90
†Sheets, No. 24, hot, ann., Pitts.	2.40	2.40	2.40	2.35
Sheets, No. 24, galvan., Pitts.	2.90	2.90	2.90	2.95
Sheets, No. 10 blue anneal., Chi.	2.00	2.00	2.00	2.15
†Sheets, No. 24, hot, ann., Chi.	2.55	2.55	2.55	2.55
Sheets, No. 24 galvan., Chi.	3.05	3.05	3.05	3.15
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh	1.90	1.90	1.90	1.90
Tin plate, per base box, Pitts.	4.75	4.75	5.00	5.00

†Comparisons are with old classification No. 24 black sheets.

SCRAP				
Heavy melting steel, Pitts.	$10.25	10.45	10.70	13.10
Heavy melting steel, eastern Pa.	7.87½	8.00	8.55	11.50
Heavy melting steel, Chicago	7.50	7.75	8.25	10.20
No. 1 wrought, eastern Pa.	9.50	9.50	9.75	13.50
No. 1 wrought, Chicago	8.00	8.00	8.25	10.00
Rails for rolling, Chicago	10.00	10.40	10.50	13.10

Sheets

Some Makers Are Reaffirming Prices—Enameling Stock Lower—Automotive More Active

SHEET PRICES, PAGE 45

Pittsburgh—Gradual improvement continues to be noted in sheet orders from automotive buyers. This business still is limited to small lots and does not approach the tonnage that is looked for when automotive operations reach the level predicted for them. In view of inquiry pending from a number of companies, however, it is believed early December will witness a material improvement in automotive sheet production. Orders from other consumers are unchanged. Although operations of full-finished mills have increased recently the average for the industry continues around 25 to 30 per cent. Several automobile companies have asked for first quarter prices but mills defer opening books for that period. The market currently is 2.40c for hot-rolled annealed sheets; 2.90c for galvanized; 1.85c for blue annealed, and 3.10c for autobody.

Philadelphia—Sheet prices are being extended into the first quarter by one mid-western mill. Moderate automotive buying continues a feature of an otherwise dull market.

Buffalo—Better demand for sheets enabled mills to increase output to as much as 45 per cent prior to Thanksgiving day. A similar rate is anticipated during the early part of December.

New York—Buying continues dull. Prices are steady, with indications that sellers will reaffirm them for first quarter.

Youngstown, O.—Preliminary negotiations for sheets for first quarter by important consumers developed a firm price attitude on the part of some producers. Some automotive builders have been placing new orders with mills and also releasing fairly good specifications. Valley mills expect that in December there will be important releases of autobody sheets. Inventories are being held down for the present. Quotations generally have not changed.

Cleveland—Enameling stock, following the initiative of the leading producer, has been reduced $3 a ton effective immediately. This places the base, No. 20 gage, at 3.25c instead of 3.40c, and No. 9-10 gage at 2.75c, instead of 2.90c. The change apparently applies to all classes of customers, even those purchasing less than 1000 pounds at a time. Other sheet prices have been reaffirmed for first quarter. November sales for all mill interests averaged close to October's volume. Sales for the balance of 1931 are expected to be slower due to customers' retrenchments for inventories. A small volume of business was placed last week, mainly for delivery after the first of the year.

Cincinnati—Production schedules at sheet mills in this district remain under 40 per cent, in the absence of heavy releases by automotive interests. Inquiry from other users is light and for early needs.

Chicago—Sheet producers in this territory have opened books for first quarter at present prices. Buying is light. Hot-rolled annealed are based on 2.50c, mills. Mechanical refrigerator production has led among sheet consuming groups in this territory during the year.

St. Louis—Sheet demand continues at a low level. Galvanized sheets are slightly more active in the South. Specifications from the automotive industry have improved moderately.

Birmingham, Ala.—The market is less active, and production has been reduced slightly. Prices are unchanged.

Urges Bond Committee

Arcade Malleable Iron Co., Worcester, Mass., in business over 100 years, unable to meet bond interest due Nov. 1, has proposed establishment of a bondholders' committee.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

HOT ROLLED No. 10

Pittsburgh base	1.70c
Gary, Ind. Harbor, base	1.80c
Chicago, del.	1.85c
Philadelphia, del.	1.99c
Birmingham, base	1.85c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.85c
Chicago, district mills	1.95c
Chicago, delivered	2.00c
Philadelphia, del.	2.14c
St. Louis, delivered	2.20½c
Birmingham	2.00c to 2.05c
San Francisco, c.i.f.	2.33c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.40c
Gary, Ind. Harbor, base	2.50c
Chicago, del.	2.55c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.75½c

GALVANIZED No. 24

Pittsburgh, base	2.90c
Gary, Ind. Harbor, base	3.00c
Chicago, del.	3.05c
Philadelphia, base	3.19c
Birmingham, base	3.05c
St. Louis, del.	3.25½c

AUTOMOBILE No. 20

Pittsburgh, base	3.10c

FURNITURE

Pitts., No. 10 heavy	2.75c
Pitts., No. 20 light	3.35c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary base	2.75c
St. Louis, del.	3.00½c

HEAVY COLD ROLLED No. 10

Pittsburgh base	2.35c
Gary, Ind. Harbor, base	2.45c
Chicago, del.	2.50c
Philadelphia, del.	2.64c
St. Louis, del.	2.70½c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, Ind. Harbor, base	3.05c
Chicago, del.	3.10c
Philadelphia, del.	3.24c
St. Louis, del.	3.30½c

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$4.75
Gary, Ind., base 10 cents higher.	
Long ternes, 24, unassorted, lb.	3.15c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c
Woven wire fencing, (9-11 ga.)	$55.00 and $60.00
(12½ ga. and lighter)	60.00 and 65.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. smaller, Pitts.	70, 10 and 5 off
Chicago, Cleve.	70, 10 and 5 off

Steel Plates

Pittsburgh, base	1.50c to 1.60c
Philadelphia, del.	1.73½c to 1.78½c
New York, delivered	1.88c
Boston, delivered	2.00c
Chicago, base	1.70c
Cleveland, del.	1.68½c to 1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.65c to 1.70c
Pacific Coast, c.i.f.	1.85c to 1.95c
St. Louis, del.	1.95½c

Structural Shapes

Pittsburgh, base	1.50c to 1.60c
Philadelphia, del.	1.69½c to 1.74½c
New York, del.	1.80¼c to 1.85¼c
Boston, del.	1.98½c
Chicago, base	1.70c
Do, public bridge work	1.65c
Cleveland, delivered	1.68½c to 1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.05c to 2.15c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.05c
Cleveland, base, local del.	1.65c
Cleveland base, out. del.	1.65c
Philadelphia, del.	1.89c
New York, del.	1.93c
Boston, del.	2.00c
Pittsburgh, cold finish	1.85c
Pittsburgh, forg. qual.	1.90c

RAIL STEEL

Chicago Heights	1.50c to 1.60c
Eastern mills	1.30c
Pittsburgh	1.30c to 1.35c

IRON

Chicago, base	1.65c
New York, delivered	1.88c to 1.98c
Philadelphia, delivered	1.84c to 1.94c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts., billet cut lengths	1.75c
Stock lengths, mill	1.60c
Chi., billet	1.50c to 1.60c
Chi., rail steel	1.30c to 1.50c
Chi., rail steel, bridge and culvert	1.40c to 1.50c
Philadelphia, cut lengths	2.04c
Cleveland, cut lengths	1.75c

Cold Finished Bars, Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.00c to 2.10c
Shafting, turned and ground, Pittsburgh, Cumberland, Md.	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	25c	26.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	7.00 to 7.50 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bars, 2.65c, mill

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10	
2300	1.50	Cr.	0.45
2500	2.25	51.00 Cr.	
3100	0.55	spring	0.20
3200	1.35	6100 bars	1.20
3300	3.80	6100 Spring	0.95
3400	3.20	Cr., Ni., Van.	1.50
4100 .15 to .25		Carbon Van.	0.95
Mo.	0.50	9250 (flats)	0.25
4600 .20 to .30 Mo.		9250 (rds.,sq.)	0.50

Strip, Hoops Bands

Hot strip, to 6-in., Pitts.	1.60c
Do, 6 1/16 to 24-in., Pitts.	1.50c
Hot strip, bands 6 in. and under, Chicago	1.75c
Do, 6 1/16 to 24 in.	1.65c
Cooperage hoop, Pitts.	1.70c to 1.80c
Do., Chicago	1.85c to 1.95c
Cold rolled strip, Pitts., Cleveland	2.05c to 2.15c
Worcester, 3 tons, over	2.30c

Rails, Track Material

Standard bess. and open-hearth rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$22.00 to $26.00
50 to 75	20.00 to 24.00
80 to 100	24.00 to 27.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.70c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.70c
Spikes boat, barge, Pitts.	2.90c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do, standard, jobbers	75 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread....73, 10 and 10 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ....73, 10 and 10 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ....73, 10 and 10 off
Tire bolts .... 60, 10 and 10 off
Stove bolts, 80-25-10 off in pkgs.; 80-25-10-2½ off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ....73, 10 and 10 off

HEXAGON CAP SCREWS

Milled ....80-10-10-5 off
Upset 1 in. diam. and smaller....85-10 off

SQUARE HEAD SET SCREWS

Milled ....80-5 off
Upset 1 in. and smaller ....80-10-5 off
Upset, larger than 1 in. 80-5off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh 2.50c
Do, less carloads, 5 kegs or over, 2.75c; less than 5 kegs 2.90c.
Chain, BB, BBB, 9/16-1½ in....33 1/3 off
Sheet piling, Pitts. 1.90c

Bars

Specifications from Automotive Builders Heavier — Miscellaneous Orders Moderate

BAR PRICES, PAGE 45

Chicago—Automotive parts specifications are giving bar mills better schedules than other heavy finished mills. Due largely to bar mill bookings, specifications of one producer in the week just closed were the best in nearly five months. While implement and tractor works contribute only a small part, specifications from this group have improved slightly. The soft steel bar base is 1.70c, mills. Further test of bar prices is expected by forthcoming automotive business. Miscellaneous equipment manufacturing lines, bolt, nut and rivet makers, and general forging also, are included in recent activity in bar specifications. Implement plants at Moline, Ill., are resuming at 25 to 30 per cent, and are planning to go on a heavier basis in March.

New York—With demand dull and foreign sellers participating in such business as develops, domestic sellers of commercial steel and iron bars are booking few orders. Domestic commercial steel bars are 1.60c, Pittsburgh; and common iron bars, 1.60c to 1.70c.

Philadelphia — Commercial steel bars are easy at 1.60c, Pittsburgh. Carlots of common iron bars are 1.60c to 1.70c.

Pittsburgh—Steel bar demand during the past week failed to maintain the slight improvement noted recently, but with some automotive interests, including Ford, expected to close on some tonnage, better activity is in prospect for the near future. Miscellaneous demands show little change and generally continue light. The market usually is 1.60c, Pittsburgh.

Youngstown, O.—Agricultural implement makers are more liberal in forwarding specifications for steel bars. The usual winter demand from the railroads is lacking. Common steel bars are 1.60c, Pittsburgh.

Cold-Finished Orders Still Marked by Scarcity

Cold Finished Prices, Page 45

Pittsburgh—Cold-finished bar specifications are spotty and total incoming business is little changed. Automotive orders are slow to increase. Practically no interest is being shown in first-quarter orders and books are unopened for that period. The market is steady at 2.10c, Pittsburgh.

Cleveland—Cold-finished steel bars are nominal at the 2.00c-2.10c, Cleveland base, in view of the light character of trading. Automotive parts concerns here are not improving their schedules. November shipments showed no gains over October.

Tin Plate Market Outlook Is Favorable

Tin Plate Prices, Page 45

Pittsburgh — Tin plate production is unchanged at a 45 per cent rate. Recent specifications have been slightly less active but the outlook is favorable for fairly steady production in the near future. Most leading consumers have contracted for the first half of 1932 but a number of smaller buyers have yet to sign. The market remains $4.75, Pittsburgh, per base box.

Plates

Miscellaneous Orders Continue Light—Pipe Line Projects to Require Some Tonnage

PLATE PRICES, PAGE 45

Chicago—Miscellaneous plate orders from boiler and tank makers, municipal work and public building projects are sustaining operations, but provide no backlogs. For the Geneseo-Rockford, Ill., gas transmission line, which will be let shortly, 10,000 tons of plates are pending. A line from Montana to Chicago for the transportation of grain is being promoted. Plate prices are untested by qauntity orders, and the base remains at 1.70c, mills. Local fabricators are bidding on 300 tons for two government oil barges. A steelworks will require 400 tons for gas holders.

Eighteen hundred tons of plates are pending for a lock and dam on the Mississippi river at Rock Island, Ill.

New York—Plate buying continues to improve slightly, with prices holding generally at 1.70c, Coatesville, Pa., for carlots. Of special interest is the reported placing of the two Seatrain vessels for which 8000 tons of plates will be required. Approximately 400 to 500 tons of special alloy plates are being placed by the American Car & Foundry Co. for the 500 subway cars for the local board of transportation.

Philadelphia—Plates are moving slowly at 1.73½c to 1.78½c, Philadelphia.

Pittsburgh—Plate business is fairly steady. Outstanding in recent inquiry is that of the Cheapeake & Ohio railroad for 4000 tons of steel material for car repair purposes, consisting largely of plates.

Cleveland—November showed no gain over October in sales or shipments. General buying holds no prospect for early improvement. On current small lots 1.60c, base, Pittsburgh, applies. Prices have not been announced for first quarter.

Contracts Placed

600 tons, plates for municipal water storage tank, Evanston, Ill., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

3300 tons, 48 and 60-inch steel pipe, department of water supply, gas and electricity, New York city, postponed until next year.

400 to 500 tons, special specification plates, for American Car & Foundry Co., business being awarded.

400 tons, gas holders, Gary works, Illinois Steel Co., Chicago.

100 tons or more, plates and shapes, elevated tank, Sing Sing prison, Ossining, N. Y.; Metro Improvement Corp., low.

100 tons, 42-inch steel water pipe for Tacoma, Wash.; alternate figures for reinforced concrete pipe; bids opened.

100 tons, plates for filter pressure work, department of water supply, gas and electricity, New York; bids Dec. 1.

Wire Prices for First Quarter Probably Steady

Wire Prices, Page 45

Chicago—Producers are expected to name $1 up on nails and wire and $2 up on rods for first quarter. Dealers' sales of merchant product continue to show modest improvement, but shipments from wire mills in November were among the lowest of the year. Wire nails to jobbers are quoted nominally at $1.95, Chicago or western mills. Merchant wire jobbers in the South have been ordering on a slightly improved scale. Plans are be-

ing made for heavier wire production in January.

Philadelphia—Nails are steady at $1.90, Pittsburgh, on light trading. Plain wire is 2.25c.

Pittsburgh—Higher prices on wire products for first quarter are expected to be announced shortly. The market currently is $1.90 to jobbers for wire nails with plain wire 2.20c and wire rods $35.

Cleveland—December inventories of wire fabricators and jobbers may be the reason for dragging sales of wire and nails. Movement of fencing and other wire products to farms is virtually absent. Nails are $1.90 minimum with plain wire 2.20c, mill.

First quarter prices on wire and wire products are expected to be announced about Dec. 1.

Bolt Price Marked Down; Recent Shading Is Met

Bolts, Nuts, Rivets Prices, Page 45

Pittsburgh—Producers have made a general extension of an extra discount of 10 per cent on bolts and nuts, now quoted at 73, 10 and 10 off. Structural rivets are relatively firmer than bolts and nuts, at 2.25c, Pittsburgh. Specifications are unchanged, with little improvement noted over October activity. Operations hold around 25 per cent.

New York—The largest current award is approximately 100 tons of bolts and rods by Rodgers & Hagerty, general contractors on foundation work for the Tri-boro bridge. Domestic sellers continue to quote 73 and two 10's off, but are finding competition with foreign sellers increasingly difficult. Foreign bolts and nuts in 5-case lots are being quoted here, delivered to consumer's door, at 73 and 25 off, and in carlots at 80 and 5 off, with even higher discounts reported. Rivets are unchanged at 2.25c, Pittsburgh.

Cleveland—Effective immediately, bolts and nuts have been officially reduced to 73 and two 10's off list. Stove bolts have been marked up five points to 80, 25 and 10 off list. Books have not been opened for first quarter. November only slight bettered the October volume of sales.

Chicago—Several makers of stove bolts have made a 5 per cent advance, quoting 80, 25 and 10 discounts for smaller lots. Weakness still exists in the price of carriage and machine bolts and nuts.

Bituminous coal production continues to average just over 8,000,000 net tons weekly.

Railroads

Northern Pacific Cars to Go to Outside Shops—C. & O. Will Buy 4000 Tons Steel for Parts

TRACK MATERIAL PRICES, PAGE 45

New York—Indications point to domestic freight car bookings this year being the smallest on record. To date approximately 9900 cars have been placed, and doubt is expressed if the total for the entire year will amount to much more than 11,000 cars, if that. Current buying is at a virtual standstill.

American Car & Foundry Co. has purchased a portion of the material required for the 500 subway cars for the local board of transportation, perhaps the latest purchase involving 1700 tons of steel castings. The cars are to be produced at the rate of 50 a month, beginning with Jan., 1932.

Pittsburgh — Railroads continue quiet buyers of steel products. New inquiry is lacking for rails and fastenings but the Chesapeake & Ohio railroad is in the market for 4000 tons of car parts for repair purposes.

Philadelphia—Norfolk & Western has awarded 1000 tons of finished steel, mostly plates, to Carnegie Steel Co. Delay may attend the placing of the Lackawanna's 12 locomotives.

Chicago — Further rail releases against the 1931 season's carryover are occurring.

Railroad shops place occasional finished steel orders. The tank car business, while below last year, is making a much better showing than other car construction. General American Tank Car Corp. works in this district are operating 35 per cent. Northern Pacific will allot 150 50-ton twin hopper cars to freight car shops instead of building these cars in the road's own shops.

Car Orders Pending

Lehigh Navigation Coal Co., one spreader car.

Northern Pacific, 150 50-ton twin hopper cars; formal inquiry given to freight car builders; cars not to be built in road's own shops, as previously announced.

Locomotives Pending

Army engineer, Washington, one 16-ton gasoline-driven locomotive.

Foreign and Eastern Iron Ore Prices Reduced

Iron Ore Prices, Page 53

New York—Foreign and eastern iron ore prices have been reduced. Swedish basic, 65 per cent, now is 8 cents per unit, alongside docks, Atlantic port, and Swedish low phosphorus ore, 9 cents, a cut of 1 cent in each. North African low phosphorus ore is off ½-cent to 8 cents. Spanish and North African basic, 50 to 60 per cent, still is quoted 7 to 8.50 cents, but the higher figure is weak. Newfoundland foundry ore, 55 per cent, is down ½-cent to 8 cents. Eastern foundry and basic ores, 56 to 63 per cent, are down 1 cent to 9 cents, delivered at eastern Pennsylvania and New Jersey furnaces, on contracts, although the revision is largely nominal. Foreign manganiferous, 45 to 55 per cent iron, and 6 to 10 per cent manganese, at 10 cents, alongside docks, Atlantic ports is nominal. The reductions in foreign ores are attributed chiefly to the drop in sterling exchange, and large stocks. Manganese ore prices, however, are unchanged.

Cleveland—Vessel shipments of Lake Superior iron ore total 23,467,786 tons for the season, the last cargoes having cleared upper lake ports. This is little more than half the 46,582,982 tons moved last year. All-rail shipments are expected to add 50,000 tons. The approximate total for the season, 23,517,786 tons, is the lowest since 1921, with 22,798,349 tons. The effect of reduced shipments this year is indicated by the Lake Superior Iron Ore association's report. This shows stocks at lower lake ports and at furnaces Nov. 1 were 1,324,447 tons less than on the same day last year. The report follows:

	Tons
Ore consumed in September....	1,470,219
Ore consumed in October.....	1,451,174
Decrease in October	19,045
Ore consumed in October, 1930	3,050,060
Ore at furnaces Nov. 1, 1931..	33,687,721
Ore on Lake Erie docks Nov. 1, 1931	6,079,512
Total at furnaces and Lake Erie docks Nov. 1, 1931.....	39,767,233
Total, Nov. 1, 1930	41,091,680

Lavino Gets Drawback

Washington—Treasury department has granted Lavino Furnace Co., Philadelphia, a drawback allowance on ferromanganese made with foreign ore at its Marietta and Sheridan, Pa., and Reusens, Va., plants.

Structural Shapes

Washington Supreme Court Job Placed—Mill Concessions Apparent on Plain Material in Larger Lots—Bids Dec. 10 on 12,000-Ton New York Elevated

STRUCTURAL SHAPE PRICES, PAGE 45

New York—Fresh inquiry for 20,500 tons of structural steel is included for projects on which closing dates for bids have been fixed. These include west side elevated highway section, department of health building, Newark subway, Jamaica armory and high school. Plans have been filed for another Hunter college unit, estimated at 3000 tons. To come out later, plans having been completed, are more than 25,000 tons, including Triboro bridge towers and other public work. Pending work on which general contracts have been placed approaches 15,000 tons. Pronounced increase in awards is expected within the next few weeks.

Boston—Bids are expected this week on the public works building, about 1200 tons. Plans are also being completed for a Saugus river bridge. Structural volume ahead is in fair volume, mostly public work. Carlo Bianchi & Co. Inc., has sublet bridge work on the Sharon-Walpole-Norwood contract. Bids are in for the Andover postoffice and figures are being taken for a school addition at Brookline. Prices on fabricated material are easy.

Philadelphia—Structural trading is light with shapes 1.695c to 1.745c, Philadelphia.

Buffalo—Awards of structurals have been limited to lots of less than 100 tons during the past week, and new inquiry of size is lacking.

Pittsburgh—Public work continues to make up the bulk of a structural steel business with a fair number of moderate lots involved in new inquiry. Plain shapes usually are 1.60c with concessions on larger lots.

Cleveland—Structural activity is less pronounced, with awards made on all but the municipal underground hall, of the active pending list. Plans on the Cleveland postoffice are not expected until after Jan. 1, the same being true for the Main street bridge. Some state bridges went in Nov. 27 at Columbus, O. The recent structural buying for municipal jobs revealed a wide open weakness in the 1.60c, Pittsburgh base for shapes, which latter figure appears to be holding on the small volume of small current business.

The underground exposition hall has been tentatively placed pending city's approval.

Chicago—About 5000 tons in structural work has been awarded, but fresh projects are few. It is probable some of the Illinois bridge work again may be readvertised, including 4100 tons for the Mannheim road bridge, Justice, Ill. Mills again are being urged to make further concessions to meet low bids submitted on public work, and structural prices are easier. Bids were taken Nov. 24 for 5000 tons of Illinois waterway bridge work.

Birmingham, Ala. — Fabricators are about 40 per cent engaged. Specifications for more than 100 tons have been less numerous recently.

Contracts Placed

4900 tons, Supreme Court building, Washington, to McClintic-Marshall Corp., Bethlehem, Pa., through George A. Fuller Co., New York, contractor.

3000 tons, grade crossing elimination, Black Rock, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

2400 tons, municipal underground garage, Cleveland, tentatively awarded to American Bridge Co., Pittsburgh, pending approval by city council; Sam W. Emerson Co., Cleveland, contractor.

2000 tons, office building, North American building, St. Louis, to Mississippi Valley Structural Steel Co., St. Louis.

1000 tons, gymnasium, University of California, Berkeley, Calif., to Judson-Pacific Co., San Francisco.

804 tons, cable laid towers and trestle, Canal Zone, Panama, to Stupp Bros. Bridge & Iron Co., St. Louis.

800 tons, Y. M. C. A. building, New York, to American Bridge Co., Pittsburgh.

460 tons, bridges, Cook and DuPage counties, Ill., to Midland Structural Steel Co., Chicago.

450 tons, bridges, Framingham-Natick, Mass., to American Bridge Co., Pittsburgh, through C. I. Homer, contractor.

408 tons, building, University of Tennessee, Knoxville, Tenn., to Converse Bridge & Steel Co., Chattanooga, Tenn.; A. H. Whisman, Knoxville, contractor.

400 tons, incinerator, Brooklyn, N. Y., to American Bridge Co., Pittsburgh.

400 tons, two state bridges, Mass., to American Bridge Co., Pittsburgh.

375 tons, bridge, St. Johnsbury & Lake Champlain railroad, Swanton, Vt., to McClintic-Marshall Corp., Bethlehem, Pa.

370 tons, highway bridge, Minnesota, to Ft. Pitt Bridge Works Co., Pittsburgh.

326 tons, two-story school, Providence, R. I., to James H. Tower Iron Works, Providence; Tucker Construction Co., Providence, contractor.

320 tons, building, Sprague-Sells Co., Hoopeston, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

315 tons, bridge over Monocacy river, Maryland, to American Bridge Co., Pittsburgh.

300 tons, Arcade building, Oak Park, Ill., to American Bridge Co., Pittsburgh; 175 tons additional to 125-ton award in STEEL, Nov. 23.

300 tons, receiving building, Safeway Stores, East Vernon avenue, Los Angeles, to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, United States embassy building, Ottawa, Ont., to United States Steel Products Co., New York, through Chris Hanson, contractor.

295 tons, 7-story Y. M. C. A., Erie, Pa., to Erie Steel Construction Co., Erie; 26 tons bars to Kalman Steel Corp., Bethlehem, Pa.; Upton & Lang, contractors.

250 tons, church, Eightieth street, Manhattan, New York, to George A. Just & Co., Long Island City, N. Y.

250 tons, addition, state capitol, Dover, Del., to Lehigh Structural Steel Co., Allentown, Pa.

230 tons, shapes and plates, two oil barges, government engineers, Cincinnati, to McClintic-Marshall Corp., Bethlehem, Pa.

225 tons, prison building, Iona, Mich., to Lake Shore Engine Works, Marquette, Mich.

216 tons, 163 tons piling to Carnegie Steel Co., Pittsburgh and 53 tons structural steel bracing for piling, to Belmont Iron Works, Philadelphia, Richmond, Pa., substation, for Philadelphia Electric Co.; United States Engineers & Contractors Inc., contractor.

200 tons, school, West Orange, N. J., to Breen Iron Works, Newark, N. J.

200 tons, filtration plant, Ft. Wayne, Ind., to Rochester Bridge Co., Rochester, Ind.

200 tons, school, Bronx (New York), to Ingalls Iron Works Co., Verona, Pa.

300 tons, shapes and bars, Protestant Episcopal church, Baltimore, to Dietrich Bros., Baltimore; M. A. Long Co., engineers and constructors.

200 tons, overhead crossing, Woodbury, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

170 tons, bridge, McCords, Mich., for Michigan state highway department, to Fort Pitt Bridge Works Co., Pittsburgh.

140 tons, land chamber, Marmot lock, Great Kanawha river, W. Va., to Dravo Contracting Co., Pittsburgh.

140 tons, Canyon bridge, Madison county, Idaho, to Minneapolis Steel & Machinery Co., Minneapolis; Zollinger & Wheelwright, Rexburg, Idaho, contractors.

Awards Compared

	Tons
Awards, week ended Nov. 28	**24,659**
Awards, week ended Nov. 21	**11,734**
Awards, week ended Nov. 14	**16,055**
Awards this week in 1930	**27,370**
Av. weekly awards, 1930....	**35,242**
Av. weekly awards, 1931....	**35,149**
Av. weekly awards, Oct.....	**22,647**
Total awards to date, 1930..	**1,740,757**
Total awards to date, 1931..	**1,687,121**

135 tons, St. Anthony bridge, Idaho, to Virginia Bridge & Iron Co., Roanoke, Va.; J. J. Badraum, Portland, Oreg., contractor.
135 tons, machine shop addition, McNeil Island prison, Wash., and marine hospital, Seattle, to Hoflus Steel & Equipment Co. and Isaacson Iron Works, Seattle.
110 tons, children's courthouse, Queens, N. Y., to J. Klein Iron Works Inc., Queens, through O'Driscoll & Lake.
109 tons, postoffice, LaCrosse, Wis., to American Bridge Co., Pittsburgh, through McGough Bros., St. Paul, contractors; 43 tons reinforcing to Kalman Steel Corp., Bethlehem, Pa.
100 tons, approximately, Swan creek bridge, Lucas county, O., 75 tons shapes to American Bridge Co., Pittsburgh; 15 tons reinforcing to Truscon Steel Co., Youngstown, O., through J. H. Berkebile Co., Toledo, O., contractor.
100 tons, garage building, sewage department, Washington, to Virginia Bridge & Iron Co., Roanoke, Va.
100 tons, bridge, North Muskegon, Mich., for Michigan highway department, to McClintic-Marshall Corp., Bethlehem, Pa.
100 tons, barracks, Quarry Heights, Canal Zone, to Decatur Iron & Steel Co., Decatur, Ala.
100 tons, bridge, Port Henry, N. Y., to American Bridge Co., Pittsburgh.

Contracts Pending

11,465 tons, including 465 tons silicon steel, 1500 tons ornamental structural steel, 345 tons steel castings, 300 tons cast iron, 100 tons ornamental cast iron, 10 tons miscellaneous iron and steel, superstructure, West Side elevated highway, Twenty-second to Thirty-eighth street, Manhattan (New York); bids Dec. 11, borough president, Manhattan.
4000 tons, Mississippi lock and dam, Rock Island, Ill.; bids Dec. 18.
3500 tons, four bascule bridges, Joliet, Ill.; John C. Paskins Co. Inc., Chicago, low on part and Mississippi Valley Structural Steel Co., Chicago, low on remainder.
2500 tons, 10-story building, department of health, hospitals and sanitation, civic center, Manhattan (New York); bids being taken, president, borough of Manhattan; closing date Dec. 21.
2300 tons, section 2, city railway subway, Morris canal from Washington street to Raymond Plaza west, Newark, N. J.; bids Dec. 11, department of public affairs, Jerome T. Congleton, director.
1200 tons, high school, Brooklyn, N. Y.
1200 tons, state bridges, Minnesota; bids Dec. 1.
1200 tons, state bridges, Illinois; bids Nov. 30.
900 tons, 2200 duplicate anchor plates, sewage plant, Cleveland; American Bridge Co., Pittsburgh, low. Incorrectly printed in STEEL, Nov. 23, awarded to Inland Steel Co., Chicago. American Construction Co., Cleveland, contractor.
800 tons, highway bridge, White county, Ill.
600 tons, apartment, Riverside drive, New York.
550 tons, addition, Bowery Savings bank, New York.
500 tons, school, Camden, N. J.; action indefinitely postponed.
500 tons, railroad station, Hughson street, Hamilton, Ont., for T. H. & B. railroad.
500 tons, baseball grandstand, Columbus, O.
400 tons, office building, King street, Toronto, Ont., for North America Life Assurance Co.
400 tons, exchange building for Illinois Bell Telephone Co., West Monroe street, Chicago; Holabird & Root, Chicago, architects.
400 tons, hotel, King street, Cobourg, Ont., for Harry Alexander, care Arlington hotel, Cobourg.
350 tons, cancer ward, San Francisco; plans being prepared, bids soon.
325 tons, sheet steel piling, Third street bridge, San Francisco; subbids being taken.
3000 tons, 104th artillery regiment armory, Jamaica (New York); bids Dec. 10, armory board, New York.
300 tons, bridges and railroad station, Quincy, Mass.
300 tons, grade crossing, New York, New Haven & Hartford railroad, Quincy, Mass.
250 tons, further addition, Lake hospital, Camden county, N. J.; bids Dec. 3.
250 tons, courthouse, Martinez, Calif.; bids Dec. 18.
240 tons, county bridge, Allentown, Pa.; bids Nov. 30.
200 tons, school, Thirty-second and Tasker streets, Philadelphia; bids Dec. 1.
200 tons, building, Oklahoma Coliseum Corp., Oklahoma City, Okla.; bids under advisement.
140 tons, East Nashville high school, Nashville, Tenn.
108 tons, deck plate girder bridge, Galia county, O., for Ohio state highway department; bids Nov. 27, Columbus, O. Included, 34 tons reinforcing steel.
100 tons, state bridge, Needham, Mass.
100 tons, school, Rising Sun and Cheltenham avenues, Philadelphia; bids Dec. 1.
Unstated, Pennsylvania railroad, contract 31; bids Dec. 8.

Concrete Bars

Radio City Bars, Largest Concrete Job, Are Placed and Will Be Rolled at Pittsburgh—New York Awards Heavier—Rock Island, Ill., Lock, 5000 Tons, Dec. 7

REINFORCING BAR PRICES, PAGE 45

New York—Contract for concrete reinforcing bars for the Radio City buildings has been placed with Empire Steel Products Co., one of the largest tonnages ever awarded for similar construction. Mesh is not included. While many thousand tons of bars will be ultimately required, definite estimates are uncertain, plans for some of the buildings not having been completed. A Pittsburgh district mill will roll the material. Lettings, outside this award, are heavier and pending volume is also promising.

Boston—Small-lot volume in concrete reinforcing bars is fairly active with some attractive business pending, mostly for public work. Prices are steadier, but buyers of larger shipments are generally successful in securing concessions.

Pittsburgh—Shipments are heavier than in October, accompanied, however, by less activity in awards. Little new business is appearing here. Billet bars usually are 1.60c, Pittsburgh, for mill lengths.

Philadelphia — Reinforcing bars are moving generally at 1.60c Pittsburgh for mill lengths.

Chicago—Leading in the reinforcing bar market is the inquiry for 5000 tons for a lock and dam in the Mississippi river at Rock Island-Davenport, bids for which will be received Dec. 7. About 250 tons has been let for a post office at Aurora, Ill. Bar prices for building work are nominal. Fresh inquiries has slowed down to a marked extent.

Awards Compared

	Tons
Awards, week ended Nov. 28	**2,543**
Awards, week ended Nov. 21	**11,567**
Awards, week ended Nov. 14	**4,189**
Awards this week in 1930..	**5,140**
Av. weekly awards, 1930..	**6,990**
Av. weekly awards, Oct.....	**7,886**
Av. weekly awards, 1931....	**7,088**
Total awards to date, 1930..	**352,872**
Total awards to date, 1931	**340,210**

Contracts Placed

Unstated tonnage, blanket contract, reinforcing bars for Radio City projects, New York, to Empire Steel Products Co., New York. Total tonnage one of largest ever placed for building construction.
600 tons, veterans' hospital, Columbia, S. C., to Knoxville Iron Co., Knoxville, Tenn.; previously reported awarded elsewhere.
350 tons, mesh and bars, highway and small bridges, state contract 2217, Long Island, N. Y., to Truscon Steel Co., Youngstown, O.; Westchester Construction Co., Farmingdale, L. I., contractor.
250 tons, postoffice, Aurora, Ill., to Calumet Steel Co., Chicago.
250 tons, Richmond, Pa., substation for Philadelphia Electric Co., to Kalman Steel Corp., Bethlehem, Pa., through United Engineers & Constructors Inc., contractor.
200 tons, east cell block, sections C and D and tunnels, Dannemora prison, New York, to Rawlins Steel Co., New

(*Concluded on Page* 52)

Strip

Light Buying Continues with Prices Unchanged—Automotive Needs Slow to Develop

STRIP PRICES, PAGE 45

Pittsburgh—Strip orders so far this month show only a slight increase over October volume. Inquiry from automotive interests remains fairly large and some small rush orders appeared during the past week. Operations at some points are slightly better but are due partly to resumptions after recent shut-downs, the average continuing around 25 per cent. Inquiry for first quarter is light and producers defer opening of books. The market continues 1.50c to 1.55c and 1.60c to 1.65c for narrow strip. Cold-rolled is 2.05c to 2.15c.

New York—Reflecting easier conditions in the Midwest, hot-rolled strip is now being quoted 1.50c to 1.55c, Pittsburgh, for wide, and 1.60c to 1.65c for narrow. Cold-rolled strip is 2.05c to 2.15c, Pittsburgh. Demand is dull.

Philadelphia—A midwestern mill has announced first-quarter hot strip at 1.55c and 1.65c, Pittsburgh, with cold-rolled at 2.15c, Pittsburgh. Meanwhile, the market is 1.50c-1.55c and 1.60c-1.65c on hot and 2.05c-2.15c on cold-rolled. Trading is spotty.

Cleveland—Several moderate releases from automotive strip fabricators came through to the mills last week and thereby sales volume rose possibly to the best weekly total in November. The orders were chiefly for hot-rolled. Some specialty work continues to be the only bright spot in cold-rolled, moving slowly at 2.05c to 2.15c, Cleveland. Hot-rolled minimum of 1.50c and 1.60c, with $1 up on some specifications, is apparently unchanged. Price announcement for first quarter, 1932, has not been made.

Operations Recede 1.5 Points to 29-30 Per Cent

Youngstown, O.—Steel operations last week averaged 34 per cent, off four points from the prior week, partly due to Thanksgiving day suspension. Operations this week are likely to increase a point or more to 35 per cent, accompanying possibly higher sheet production, although pipe production shows no improvement. As of Nov. 28, 23 of 66 open hearths were melting, against 26 the prior week.

Philadelphia — Steel production was fractionally higher last week at 28-29 per cent, a leading interest having advanced three points to 34 per cent. Little change is expected this week.

Buffalo — Operations of open hearths are up nearly eight points to near the 35 per cent mark this week following last week's dip to 27 per cent. Staggered operations are the reason for the fluctuation. There is some hope of continuance of a rate near 35 per cent for this week, but this is not certain.

	Per Cent
Operations, week ended Nov. 28	29.5
Optrations, week ended Nov. 21	31
Operations, week ended Nov. 14	31
Operations, this week, 1930	40
High for 1931 (March 19)	57
Low for 1931 (Oct. 24)	27

Pittsburgh—Average ingot operations during the past week dropped slightly below the 30 per cent rate prevailing the preceding week, partly as a result of the Thanksgiving holiday. Little change from a 28 to a 30 per cent rate is in prospect for this week. Blast furnace schedules continue at ten active steelworks stacks of 54. Sheet output holds around 25 to 30 per cent with tin plate continuing 45. Strip and pipe are unchanged at 25.

Cleveland—Steel production was down six points as of Nov. 28, to 38 per cent capacity, representing 13 of 34 active open hearths. The same rate is being continued this week. Otis Steel has four Riverside open hearths on, Steel & Wire has four and McKinney, five active.

Chicago—Further reduction of active open hearths leaves ingot output scheduled for this week at 23 to 24 per cent. Production in the week just closed was about 24 per cent. Bar mills are leading heavy finished departments with 28 to 30 per cent operations. Rail mills are operating about 20 per cent, and sheet mills 20 to 25.

Birmingham, Ala.—Thirty per cent steel operations continue this week unchanged, Tennessee Coal, Iron & Railroad Co. having five of 17 open hearths producing and Gulf States Steel three of six at Gadsden.

Warehouse Steel Sales Display Little Change

New York—Volume is tapering. A possible exception is cold rolled, some jobbers noting a slight increase in orders. Prices on most products are easy. This is especially true of bolts and nuts, influenced by foreign competition on some sizes. The pipe market is mixed due to activity of one mill competing with jobbers.

Pittsburgh—Business is slow and little changed from the October rate, with little improvement in prospect. Orders usually represent urgent requirements. Prices are unchanged.

Detroit—Due to holiday inroads as November closed, the month failed to show appreciable gain over October. Day-to-day sales are without particular change from those prevailing for some time.

Cincinnati — Warehouse tonnage was off slightly last week, as anticipated, on account of the holiday, but jobbers are satisfied with November business in comparison with October.

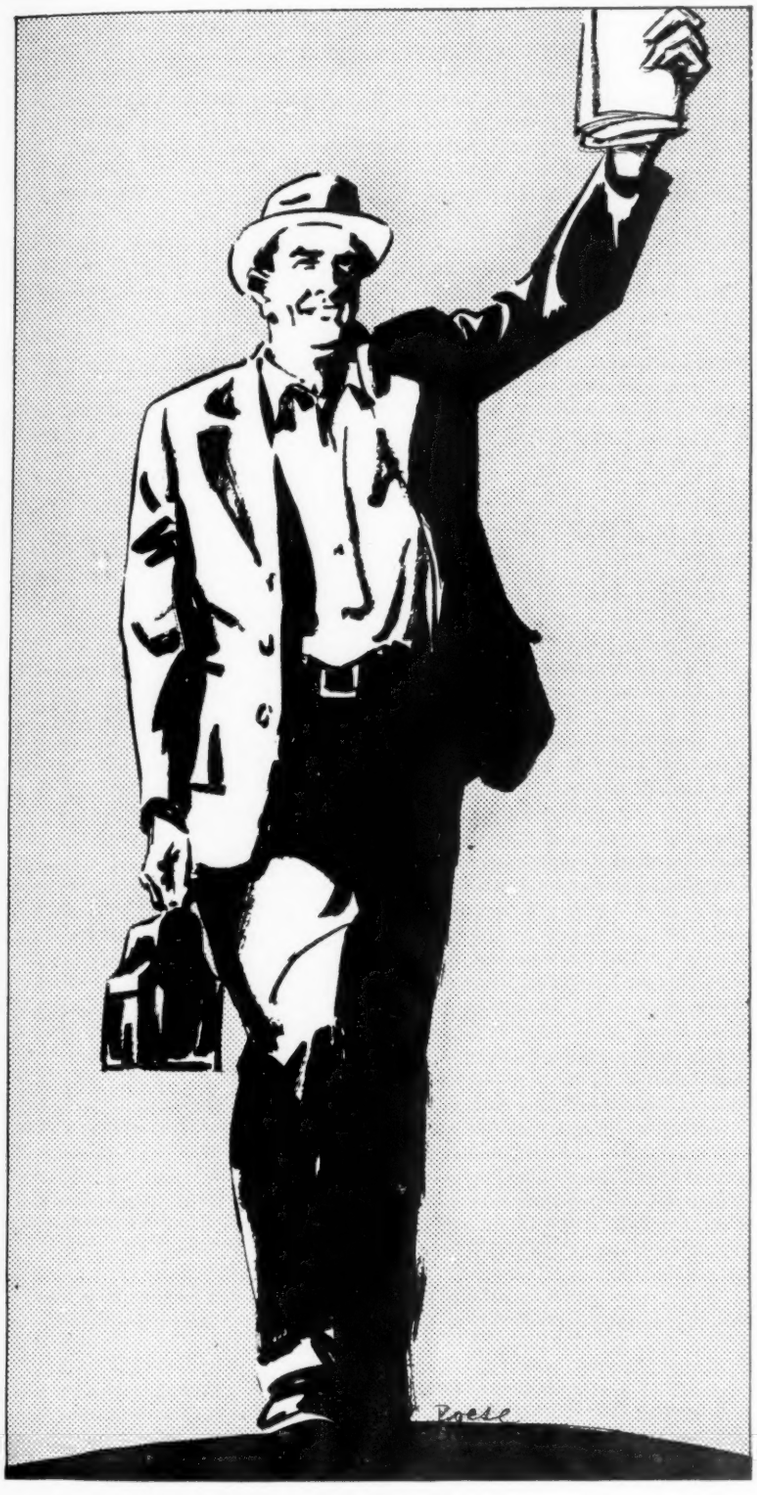
St. Louis—Distributors of steel from stock report business irregular and spotty, but with the average during the first three weeks of November slightly better than during the entire month of October. There has been some betterment in demand from certain manufacturing lines.

National Founders Name District Committees

New York District committees to serve during 1932, announced at the 35th annual meeting of the National Founders' association, are: First district—Frank R. Hoadley, Farrel-Birmingham Co. Inc., Ansonia, Conn.; Edward F. Parks, Universal Winding Co., Auburn, R. I.; Second district—E. B. McKenna, Standard Foundry Co., Buffalo; Third district— William L. Litle, Bucyrus-Erie Co., Erie, Pa.; George T. Ladd, United Engineering & Foundry Co., Pittsburgh; Fourth district—William B. Cullen, Miami Foundry Co., Miamisburg, O.; Fifth district—A. H. Head, John Deere Tractor Co., Waterloo, Iowa; W. F. Heesch, French & Hecht Inc., Davenport, Iowa; F. Ackerman, Curtis Mfg. Co., St. Louis; Sixth district—Curry S. Prescott, Prescott & Co., Menominee, Wis.; John W. Brawley, South Park Foundry & Machine Co., St. Paul; Seventh district—W. F. Tynes, Hardie-Tynes Mfg. Co., Birmingham, Ala.; C. P. Caldwell, Caldwell Foundry & Machine Co., Birmingham; H. A. McLellan, General Fire Extinguisher Co., Atlanta, Ga.

Keep his head up

and we'll all come through!



You recognize this man. He lives in your own town, not far from you . . .

Though faced with unemployment, he is combating adversity with courage. He has retreated step by step, but fighting. He has spread his slender resources as far as they will go.

This winter he and his family will need your help.

There are many other heads of families much like him in the United States. This winter all of them will need the help of their more fortunate neighbors.

This is an emergency. It is temporary. But it exists. It must be met with the hopefulness and resource typical of American conduct in emergencies.

Be ready! Right now in every city, town and village, funds are being gathered for local needs—through the established welfare and relief agencies, the Community Chest, or special Emergency Unemployment Committees . . .

The usual few dollars which we regularly give will this year not be enough. Those of us whose earnings have not been cut off can and must double, triple, quadruple our contributions.

By doing so we shall be doing the best possible service to ourselves. All that America needs right now is courage. We have the resources. We have the man power. We have the opportunity for world leadership.

Let's set an example to all the world. Let's lay the foundation for better days that are sure to come.

The President's Organization on Unemployment Relief

Walter S. Gifford

WALTER S. GIFFORD, DIRECTOR
Committee on Mobilization of Relief Resources

Owen D. Young

OWEN D. YOUNG, CHAIRMAN

The President's Organization on Unemployment Relief is non-political and non-sectarian. Its purpose is to aid local welfare and relief agencies everywhere to provide for local needs. All facilities for the nation-wide program, including this advertisement, have been furnished to the Committee without cost.

Concrete Bars Placed

(*Concluded from Page 49*)

York; Amsterdam Building Co. Inc., New York, contractor.

200 tons, Illinois roadwork, to Inland Steel Co., Chicago.

200 tons, Cuyahoga county bridge, North Woodland road, Cleveland, to Builders Structural Steel Co., Cleveland, through Highway Construction Co., contractor.

190 tons, library, Columbia university, New York, to Empire Steel Products Co., New York; Marc Eidlitz & Son, New York, contractors.

160 tons, building, University of Tennessee, Knoxville, Tenn., to Wilson-Weesner-Wilkerson Co., fabricated by Knoxville Iron Co., Knoxville, A. H. Whisman, Knoxville, contractor.

150 tons, Illinois bridge work, to Calumet Steel Co., Chicago.

140 tons, barracks and sewers, Quarry Heights, Canal Zone, to Truscon Steel Co., Youngstown, O., through Nelso Construction Co., Columbus, Ga.

135 tons, two-story school, Providence, R. I., to Truscon Steel Co., Youngstown, O.; Tucker Construction Co., Providence, general contractor.

118 tons, two dormitories, Tennessee Agricultural and Industrial Normal school, Nashville, Tenn., to Wilson-Weesner-Wilkerson Co., Nashville; Angle-Blackford Co., Nashville, contractor.

100 tons, grade crossing, Valhalla station, Mt. Pleasant, N. Y., to Concrete Steel Co., New York; Tuller Construction Co., Red Bank, N. J., contractor.

100 tons, Illinois road work, Calumet Steel Co., Chicago.

Contracts Pending

5000 tons, lock and dam in Mississippi river, near Rock Island, Ill.; bids Dec. 7.

825 tons, superstructure, West Side elevated highway, Twenty-second to Thirty-eighth street, Manhattan (New York; bids Dec. 11, president, Borough of Manhattan. Contract also calls for 25,200 square feet mesh reinforcement.

700 tons, state bridges, Massachusetts.

500 tons, sewer for sanitary district, Twenty-second street and Blue Island avenue, Chicago; W. J. Newman Co., Chicago, contractor.

500 tons, public works building, Boston.

550 tons, supreme court building, Washington.

400 tons, North American building, St Louis.

362 tons, gymnasium, University of California., Berkeley, Calif.; subbids being taken.

315 tons, St. Elizabeth hospital, Washington.

175 tons, East Nashville high school, Nashville, Tenn.; V. L. Nicholson Co., Nashville, contractor.

130 tons, addition, Westinghouse high school, Pittsburgh; Navarro Co., Pittsburgh, contractor.

113 tons, two bridges, San Luis Obispo county, Calif.; bids Dec. 9.

Revise Standard on Forms

Washington—Department of commerce is distributing, for acceptance, the revised standard on forms for concrete joist construction floors.

Pipe

Argentina to Buy 8000 Tons Oil Pipe—Texas Feeder Line Active —Cast Iron Purchases Gain

New York—Argentine government is taking bids on 8000 tons of miscellaneous sizes of steel oil pipe. Bids go in this week on several sewer contracts in Westchester county, taking several hundred tons of cast pipe. Washington suburban sanitary district is closing on several thousand tons of 6 to 24-inch centrifugal. The Emaus, Pa., foundry booked a lot for a sewer disposal plant at Great Meadow prison through a Schenectary contractor. Prices continue weak.

West Side elevated highway, Manhattan, will require a tonnage of wrought iron and steel pipe, small sizes, bids Dec. 11. Syracuse, N. Y., has taken new bids on 600 tons, United States Pipe & Foundry being low. Cicero, N. Y., has bought more than 500 tons.

Boston—New inquiry for cast pipe is light, although small-lot business is fairly active. Waterville, Me., will buy close to 100 tons. Price are weak. Details on a recent Connecticut tonnage reveals low bid was close to $27 delivered on small sizes, about 1000 tons being involved.

Pittsburgh—Continental Construction Co. is expected to place the first half of its 170-mile extension from its main line to Milwaukee shortly. This will take around 12,000 tons of 20-inch pipe. No other line pipe projects are scheduled for early closing although a number are in prospect for later action. Standard pipe business has been maintained slightly better than usual so far this month.

Cleveland—A distinctly better volume of orders for steel pipe was noted last week. The lots were chiefly for jobbers' stocks.

Chicago—About 1000 tons of welded pipe line work is active at Denver. Texas Empire Pipe Line Co. is planning to build a 12-inch pipe line from Lima Station, Seminole county, Tex., to East Texas, where it will connect the Seminole-Chicago line with the East Texas-Gulf line now in operation. Larger cast pressure pipe quotations are nominal at $40 to $43, Chicago. Barberton, O., has awarded 1300 tons of 24-inch cast.

Cast Pipe Placed

1300 tons, 24-inch, Barberton, O., to James B. Clow & Sons, Chicago.

500 tons, 4 to 10-inch, Cicero, N. Y., to unstated.

375 tons, 4 to 12-inch, Panama, to American Cast Iron Pipe Co., Birmingham, Ala.

300 tons, 14 to 24-inch, class A, sewer, section Z, Mamaroneck project, Westchester county, N. Y., to Donaldson Iron Works, Emaus, Pa.; Frank Nordone Co., contractor.

280 tons, 4 to 12-inch, department of water supply, gas and electricity, Manhattan (New York), to United States Pipe & Foundry Co., East Burlington, N. J.

Steel Pipe Placed

100 tons, heating system, Boston postoffice, to Youngstown Sheet & Tube Co., Youngstown, O., through Cleghorn Co., Boston.

Cast Pipe Pending

1037 tons, 2 to 8-inch class 150 and 250 or B, East Bay municipal utility district, Oakland, Calif.; bids Dec. 3.

600 tons, 20 and 24-inch, Syracuse, N. Y.; United States Pipe & Foundry Co. low, former bids rejected.

500 tons or more, several sections, sewer, Westchester county; bids on several contracts, Dec. 4.

145 tons, 14-inch, class A or class 150 centrifugal, section J, Mamaroneck project, Westchester county sanitary sewer commission, White Plains, N. Y.; bids in direct on pipe.

100 tons, 16 and 20-inch with fittings, filtration plant, Fresh Meadow lane, Flushing, Queens (New York); bids Dec. 1, department of water supply, gas and electricity.

Unstated tonnage, involving: 3000 feet, 60-inch; 8500 feet, 36-inch; 5000 feet, 30-inch and a large tonnage of various smaller sizes, Buffalo construction program. Award pending city council approval. Expenditure to involve $2,200,000.

Steel Pipe Pending

8000 tons, miscellaneous sizes of oil pipe, Argentine government; bids asked.

1000 tons, probably welded pipe for Denver, Colo.

400 tons, steel and cast iron, small sizes, gas mains and service lines, marine barracks, Quantico, Va.; Thomas B. Rathbone & Co., contractor.

300 tons, 5 3/16-inch steel casing, for Atlantic Oil Producing Co., Philadelphia.

175 tons, steel, up to 3-inch, and wrought iron, up to 3½-inch, conduits, electrical work, West Side elevated highway section, Twenty-second to Thirty-eighth street, Manhattan, N. Y.; bids Dec. 11.

Unstated tonnage, 12-inch pipe line from Lima Station, Seminole county, Tex., to East Texas, for Texas Empire Pipe Line Co., Tulsa, Okla.

Unstated tonnage, 17-mile 4-inch steel pipe line near Greely, Colo.; Gordon Construction Co., contractor.

General Grinder Corp., 240 North Milwaukee street, Milwaukee, has changed its name to General Hardware Corp. Louis V. Shaw is secretary. Addition of several lines to its products caused the change in name.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, No. 2

Chicago furnace	$17.00
Pittsburgh, dist. fur.	17.00
Pittsburgh, delivered	17.63 to 18.13
Valley furnace	16.00 to 16.50
Cleveland fur., local del.	17.00
Philadelphia, delivered	15.51 to 16.01
Virginia furnace	17.50
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.00
Buff., all-rail, Boston	19.91 to 20.41
Buff., all-rail, Brooklyn	19.15 to 19.90
Buff., all-rail, Newark	17.53 to 18.28
Ala., Bir. fur., local del.	12.00
Alabama, del. Chicago	17.01
Alabama, del. St. Louis	15.42
Alabama, del. Cincinnati	14.69 to 15.19
Ala., Phila., dock del.	16.00 to 16.25
Ala., Balt., dock del.	16.00
Alabama, New York dock	16.50
Ala., Boston dock del.	16.50 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	14.69 to 15.19
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	17.50
Buff., all-rail, Brooklyn	19.90 to 20.40
Buffalo, all-rail Newark	18.28 to 18.78
Buff., all-rail, Boston	20.91 to 21.41
Virginia furnace	18.00
Eastern, del. Phila.	16.01to 16.51

FOUNDRY, NO. 1X

Buffalo 1ur., local del.	18.50
Eastern, del. Phila.	16.51 to 17.01

MALLEABLE

Valley furnace	16.50
Cleveland fur., local del.	17.00
Pittsburgh dist. fur.	17.00
Pittsburgh, delivered	17.63 to 18.13
Chicago, furnace	17.00
Buffalo fur., local del.	17.50
Eastern Penna., delivered	17.76 to 19.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	15.50 to 16.00
Pittsburgh, delivered	16.13 to 17.13
Eastern Penn., del.	16.00 to 16.50
Buffalo fur., local del.	16.50 to 17.00
Montreal, delivered	23.50
Valley, furnace	15.00 to 15.50

BESSEMER

Valley furnace	16.50
Pittsburgh, delivered	17.63 to 18.13
Pittsburgh, furnace	17.00

LOW PHOS.

Valley fur., standard	2700
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	16.00
Pittsburgh district fur.	16.50
Pittsburgh, delivered	17.13 to 17.63

CHARCOAL

Lake Superior, del. Chi.	25.04

SILVERY

Jackson County, O., fur. in per cents: 6—$19; 7—$19.50; 8—$19.00 to $21.00; 9—$20.50; 10—$21; 11—$22; 12—$23; 13—$25.

BESSEMER FERROSILICON

Jackson County, O., fur. in per cents: 10—23; 11—$24; 12—$25; 13—$27; 14—$29; 15—$31; 16—$33.

Coke

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.35 to 2.40
Connellsville foundry	3.25 to 4.50
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.70 to 9.10
Chicago, ovens	7.50
New England, del.	10.50
St. Louis, del.	8.50
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo, ovens	8.00 to 8.50
Detroit, ovens	8.00
Philadelphia, del.	8.75

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	9.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% man.	(nom) 10.00
North African low phos.	8.00
Swedish basic, 65%	8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.50
Newfoundland fdy., 55%	8.00
Tungsten, spot and future short ton unit, duty paid	$11.00 to 11.25
Chrome ore, 48% net ton c.i.f.	$19.50 to 20.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 cents
South African, 52%	24 to 26 cents
South African, 49-51%	23 to 24 cents
South African, 44-47%	22.50 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$40.00
Missouri	37.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 35.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	40.00
Joliet, Ill., East Chicago, Ind.	49.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$45.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Balt. base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$29.00
Pittsburgh, bessemer	29.00
Youngstown	29.00
Cleveland	29.00
Philadelphia	34.30
Chicago	30.00
Forging, Chicago	35.00 to 36.00
Forging, Pittsburgh	35.00
Forging, Philadelphia	39.30

SHEET BARS

Pittsburgh	29.00
Youngstown	29.00
Cleveland	29.00
Chicago	30.00

SLABS

Pittsburgh	29.00
Youngstown	29.00
Cleveland	29.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Silicomang., 2½% carb.	105.00
2% carbon	110.00
1% carbon	115.00
(Spot prices, $5 a ton higher.)	
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. lb., con. del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.20
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.40
Ferro-titanium carload producers' plants, net ton	150.00
Do, one-ton to c. l.	160.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50
Ferromolybdenum, stand. 50-60 per cent, per lb.	$1.00
Cal. Molybdate, lb. cont.	.85

†Carloads. Differentials apply to quant.
*To users of carloads to 500 tons annually. Differentials to large users.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$13.00
Washed gravel, import duty paid east, tide, gross ton	18.50

Pig Iron

November Shipments Slightly Larger Than October's—Current Sales Light—Prices Steady

PIG IRON PRICES, PAGE 53

Pittsburgh—Pig iron demand is spotty, some gains being noted in shipments to certain points while requirements of most foundries are unchanged. New business continues quiet and little improvement is looked for over the remainder of the year as consumers are expected to restrict their purchases and inventories until Jan. 1. The market is nominally unchanged at $16 to $16.50, valley, for No. 2 foundry, $16.50 for bessemer and malleable and $15 for basic.

Shenango Furnace Co. will blow in one Sharpsville, Pa., stack Dec. 1.

Boston—More interest is shown by textile machine builders. One consumer is reported sounding the market for first quarter. Buying has improved slightly. The New England furnace took the bulk of business placed, doing better than $19, furnace. Both Buffalo and eastern New York producers are reported to have shaded $15, furnace, on desirable business. From Beacon $19 to $20, delivered, is reported. Jobbing foundries are buying better.

New York—Purchase of 475 tons for the Harrison, N. J., plant of the Worthington Pump & Machinery Corp. features a dull pig iron market. This order was placed with an eastern Pennsylvania furnace. The remainder of current business for the week, totaling 2000 tons, is made up of carlots. Prices are stronger, with Buffalo iron $14.25 to $15, furnace. Eastern Pennsylvania iron for delivery in this district is on a comparable basis. Southern iron is moving slowly at $16.50, delivered New York docks.

Philadelphia—More sales of foreign pig iron are noted, bringing the total for these for November in this district up to 6000 tons. The minimum price for this iron is $16 on cars at port, duty paid. Reports of offerings at $15 appear incorrect. A Baltimore melter is buying on an inquiry for 1000 tons. Sales of domestic iron generally are small.

Buffalo—Demand is near the low point of the year. Eastern competition is strong. Four furnaces are making iron in the district, with one due to resume operations next week.

Youngstown, O.—Occasional small shipments of No. 2 foundry and malleable continue to be made by valley producers of pig iron. No further change in blast furnace activity is noted since last week when one steelworks stack was banked. Prices are steady.

Cleveland—Sales continue to increase moderately, Cleveland furnace companies having booked more than 5000 tons in the past week. November shipments will be about 10 per cent larger than those of October. Many of the sales now being made are for delivery in December and in the first quarter, and on these current prices prevail. Some business also has been booked exclusively for first quarter at the same prices. Orders generally are for small lots, at $15.50, base, Cleveland furnace, for outside shipment, and $17 for local delivery.

Cincinnati—Shipments of pig iron in this district were reduced only slightly during the past week by the holiday, but sales were affected. Interest in first quarter is quiet. Recent inquiries, including one for 800 tons from northern Ohio, indicate northern iron prices have not strengthened. A southern Ohio melter is inquiring for 500 to 1000 tons.

Chicago—Mercahnt pig iron buying continues relatively more active than that for finished steel although sales have shown little improvement over October. Expected seasonal inactivity next month is expected to cut down shipments to melters' yards, which for November were about 20 per cent over October. Shipping releases are being made with more caution. Prices for the base grades are quoted $17, Chicago furnace.

St. Louis—A few carloads for prompt shipment were sold in this district in the past week. The total was less than 1000 tons. Users of basic iron have made no purchases recently. Not much change is looked for until the first quarter.

Birmingham, Ala.—Demand continues slow, both in the Alabama district and from outside territory. Production is at a minimum, and iron is being placed on some furnace stockpiles. Two companies are shipping their output.

Toronto, Ont.—The market is beginning to show a better undertone. Sales for the week advanced to around 500 tons. Melters are holding orders to spot delivery. Production is on the up grade.

By-product coke plants consumed 3,338,529 net tons of coal in September, against 4,951,447 tons in September, 1930.

Ferroalloy Contracts Slow; Price Delayed

Ferroalloy Prices, Page 53

New York—In view of slack conditions in the steel industry, sellers of ferromanganese may delay announcing contract prices for next pear. Usually these prices come out about Dec. 1. Meanwhile, ferromanganese continues at $85, duty paid, in carlots. Spiegeleisen is quiet at $30, furnace.

Chicago—An eastern steelworks is reported to be placing some ferromanganese business. A few 1932 ferroalloys contracts have been placed, subject to announcement of price schedules. November specifications and shipments were below October.

Wire Rods Stronger For First Quarter

Semifinished Prices, Page 53

Pittsburgh—Despite a slight gain in semifinished steel shipments recently incoming business so far this month is off moderately from the October volume. Finishing mills are buying only for current needs and orders are small, with the market usually $29, Pittsburgh, for rerolling billets, sheet bars and slabs. Forging billets and wire rods are $35. An advance in the rod price is in prospect for the first quarter.

Youngstown, O.—With tin plate mills preparing to start their winter work for anticipated spring deliveries, tin bars are displacing sheet bars in consumer interest for the moment. Some interest is shown in billets by stripmakers, due to automotive demand. Shipments of manufacturers' wire and wire rods continue about on a level with previous weeks. Billets, sheet bars and slabs hold at $29, Youngstown and Pittsburgh, and wire rods at $35, Pittsburgh and Cleveland.

Chicago—Boat shipments of sheet bars and other semifinished steel to the Detroit district are being completed. Prices are nominal for small billets, blooms and slabs. Billets, 4 x 4-inch base, are quoted $30, Chicago. Wire rods are $36, Chicago.

Continue Abrasive Code

Washington—The simplified practice recommendations on abrasive grain sizes have been reaffirmed without change for one year.

Scrap

Further Declines in Some Grades—Producers Hold Back Because of Low Prices Offered

Chicago—Releases of scrap by producers and railroads are exceedingly slow because of the low prices offered, and dealers find it difficult to book business because of buyers' pressure for even lower quotations. Credit conditions also are an influence in the low volume of bookings. The last cargo of cast borings this season from the Chicago district by boat left for the East Nov. 30. As much of this small shipment was left-over, this cargo has had little effect on the borings market. The leading independent melter again has cut down receipts of heavy melting steel, but this probably will be temporary. Prices are nominal for all grades. Feeling is less buoyant because of the lower steelworks operations in this district.

Boston—Absence of demand for

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.00 to 8.50
Boston, dealers	4.50 to 5.00
Buffalo, No. 1	8.50 to 9.00
Buffalo, No. 2	7.00 to 7.50
Chicago	7.50 to 8.00
Cinci., deal.	7.25 to 7.75
Cleve., No. 1	7.25 to 7.75
Cleve., No. 2	7.00 to 7.50
Det., No. 1 deal.	6.00 to 6.50
Det., No. 2 deal.	4.50 to 5.00
E. Pa. del. mill	7.25 to 8.50
N. Y. deal. R. R.	5.50 to 6.00
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	3.50 to 4.00
Pitts. No. 1	10.00 to 10.50
St. L. No. 1 sel.	8.00 to 8.20
Federal, Ill.	7.00 to 7.50
Granite City, Ill.	7.00 to 7.50
Valleys, No. 1	9.25 to 9.75

COMPRESSED SHEETS

Buffalo, dealers	7.00 to 7.50
Chi. (Factory)	6.50 to 7.00
Cleveland	7.00 to 7.25
Detroit, dealers	6.00 to 6.50
E. Pa. new mat.	7.00 to 8.00
Pittsburgh	9.75 to 10.25
Valleys	8.75 to 9.25

BUNDLED SHEETS

Buffalo	6.50 to 7.00
Cinci. deal.	6.75 to 7.25
Cleveland	6.00 to 6.50
Eastern Pa.	6.00 to 6.50
Pittsburgh	9.00 to 9.50
St. Louis	3.50 to 4.00

SHEET CLIPPINGS LOOSE

Chicago	4.00 to 4.50
Cincinnati	4.00 to 4.50
Detroit, dealers	3.75 to 4.25
St. Louis	3.50 to 4.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	4.50 to 4.75
Buffalo	12.00 to 12.50
Chicago (3 ft.)	8.75 to 9.25
Chicago (2 ft.)	9.75 to 10.25
Cinci., deal.	12.00 to 12.50
Detroit, deal.	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	12.50 to 13.00
St. Louis	12.00 to 12.50

STOVE PLATE

Birmingham	7.00 to 7.50
Boston, con.	4.50 to 5.00
Buffalo	8.50 to 8.75
Chicago, net	7.00 to 7.50
Cinci., deal. net	4.50 to 5.00
Det., net deal.	4.00 to 4.50
Eastern Pa.	7.50
N. Y., deal. mill	4.75 to 5.50
St. Louis	6.50 to 7.00

COUPLERS, SPRINGS

Buffalo	11.00 to 11.50
Chicago	9.00 to 9.50
Eastern Pa.	10.50 to 11.00
Pittsburgh	11.00 to 11.50
St. Louis	8.50 to 9.00

ANGLE BARS—STEEL

Chicago	8.75 to 9.25
St. Louis	7.50 to 8.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00 to 12.50
Cleveland bil. and bloom crops	14.00 to 14.50
Eastern Pa.	12.00 to 13.00
Pittsburgh billet bloom crops	14.00 to 14.50
Pitts. sheet bar crops	13.00 to 13.50

FROGS, SWITCHES

Chicago	8.00 to 8.50
St. Louis	8.50 to 9.00

SHOVELING STEEL

Chicago	7.50 to 8.00
Cleveland	6.25 to 6.50
St. Louis	7.00 to 7.50

RAILROAD WROUGHT

Birmingham	7.00 to 8.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	7.00 to 7.50
Buffalo, No. 2	9.00 to 9.50
Chicago, No. 1	8.00 to 8.40
Chicago, No. 2	7.50 to 8.00
Cinci., No. 2	7.25 to 7.75
Eastern Pa.	9.50
N. Y., No. 1, deal.	7.00 to 7.50
Pitts., No. 2	10.00 to 10.50
St. Louis, No. 1	5.00 to 5.50
St. Louis, No. 2	7.00 to 7.50

SPECIFICATION PIPE

Boston	4.00 to 4.25
Eastern Pa.	9.50 to 10.00
N. Y., deal.	5.00 to 5.50

BUSHELING

Buffalo, No. 1	7.00 to 7.50
Chicago, No. 1	6.50 to 7.00
Cinn., No. 1 dl.	5.50 to 6.00
Cinn., No. 2	3.50 to 4.00
Cleve., No. 2	5.75 to 6.00
Det., No. 1 new deal.	5.00 to 5.50
St. L., No. 1	6.00 to 6.50
Val. new No. 1	8.75 to 9.25

MACHINE TURNINGS

Birmingham	3.50 to 4.00
Boston, dealers	1.35 to 1.50
Buffalo	4.75 to 5.25
Chicago	4.00 to 4.50
Cinn., deal.	3.75 to 4.25
Cleveland	5.00 to 5.50
Detroit	3.50 to 4.00
Eastern Pa.	5.00 to 5.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.00 to 7.50
St. Louis	3.00 to 3.50
Valleys	6.75 to 7.25

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	1.30 to 1.50
Buffalo	6.50 to 7.00
Cinn., deal.	3.75 to 4.25
Cleveland	5.25 to 5.75
Detroit, deal.	4.25 to 4.75
Eastern Pa.	3.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.00 to 7.25

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	3.50 to 4.00
Boston, chem.	6.50 to 7.25
Boston, deal.	1.50 to 1.75
Buffalo	6.00 to 6.50
Chicago	4.00 to 4.50
Cinn., deal.	3.75 to 4.25
Cleveland	5.25 to 5.75
Detroit, deal.	4.25 to 4.75
Eastern Pa.	3.50
E. Pa., chem.	10.50 to 12.00
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.00 to 7.25
St. Louis	5.50 to 6.00

PIPE AND FLUES

Cinn., deal.	6.00 to 6.50

RAILROAD GRATE BARS

Buffalo	6.50 to 7.00
Chicago, net	5.75 to 6.25
Cincinnati	5.00 to 5.50
Eastern Pa.	7.50
N. Y., deal.	5.00 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, deal.	5.00 to 5.25
Buffalo	7.00 to 7.50
Cleve. ov. 10 in.	7.00 to 7.50
Detroit	5.00 to 5.50

FORGE SCRAP

Boston, del.	2.00 to 2.25
Chicago	10.50 to 11.00
Eastern Pa., del.	7.00 to 8.00

ARCH BARS, TRANSOMS

Chicago, net	8.50 to 9.00
St. Louis	6.50 to 7.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	7.50 to 8.00
Chi., steelworks	6.50 to 7.00
Cleveland	6.75 to 7.00
Eastern Pa. del.	7.00 to 8.00
Pittsburgh	9.25 to 9.75
St. Louis	6.50 to 7.00

STEEL CAR AXLES

Birmingham	11.50 to 12.00
Boston, ship. pt.	11.00 to 12.00
Buffalo	12.00 to 12.50
Chicago	12.90 to 13.45
Eastern Pa.	15.50 to 16.00
St. Louis	11.50 to 12.00

SHAFTING

Bos., ship. pt.	10.00 to 10.50
Chicago	8.40 to 8.95
N. Y., deal.	9.00 to 9.50
St. Louis	9.00 to 9.50
E. Penna.	15.00 to 15.50

CAR WHEELS

Birming. iron	8.00 to 9.00
Boston, iron	12.50 to 13.50
Buffalo, iron	10.00 to 10.50
Buffalo, steel	10.50 to 11.00
Chicago, iron	9.00 to 9.50
Chi. rolled steel	9.00 to 9.50
Cincinnati, iron	9.50 to 10.00
E. Pa. steel	10.00 to 10.50
E. Pa. iron	11.00 to 11.50
Pitts. iron	10.00 to 10.50
Pitts., steel	11.00 to 11.50
St. Louis, iron	7.00 to 7.50
St. Louis, steel	8.50 to 9.00

NO. 1 CAST SCRAP

Birmingham	9.00 to 9.50
Buffalo (mach.)	10.25 to 10.75
Boston, textile	7.00 to 8.50
Chicago, mach.	9.00 to 9.50
Chi., railroad	8.10 to 8.70
Chicago, agri.	7.60 to 8.10
Cinn., mach. cup., gross	11.00 to 11.50
Cleve. cupola	10.00 to 10.50
Det., net deal.	8.00 to 8.50
E. Pa., cupola	11.50
N. Y. cup. deal.	7.00 to 7.50
N. Y., del. local foundries	12.00
Pitts., cupola	10.00 to 10.50
San Fran., del.	13.50 to 14.00
Seattle	5.00 to 7.50
St. L. No. 1 ma.	8.50 to 9.00
St. L., No. 1	7.50 to 8.00

HEAVY CAST

Boston	6.00 to 6.50
Bost. mach. cast	8.00 to 9.00
Buffalo, break	6.75 to 7.25
Cleve., break	6.00 to 6.50
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	5.00 to 5.50
Eastern Pa.	9.00 to 9.50
N. Y. break, dl.	5.75 to 6.00
N. Y No. 1 dl.	7.00 to 7.50
Pittsburgh	8.00 to 8.75

MALLEABLE

Boston R. R.	11.50 to 12.00
Buffalo	10.00 to 10.50
Chicago, agri.	7.50 to 8.00
Chicago, R. R.	8.00 to 8.50
Cinci., R. R. del.	9.25 to 9.75
Cinci., agri. del.	9.00 to 9.50
Cleveland, rail	10.00 to 10.50
Det. auto deal.	9.50 to 10.00
St. Louis, rail	6.00 to 6.50

RAILS FOR ROLLING
5 feet and over

Birmingham	10.00 to 10.50
Boston, deal.	6.00 to 7.00
Buffalo	10.00 to 10.50
Chicago	10.00 to 10.50
Eastern Pa.	11.50 to 12.00
New York	6.25 to 6.75
St. Louis	10.00 to 10.50

LOCOMOTIVE TIRES

Chicago, cut	10.50 to 11.00
St. L., No. 1	9.00 to 9.50

LOW PHOS. PUNCHINGS

Chicago	11.25 to 11.75
Buffalo	12.00 to 12.50
Eastern Pa.	13.00
Pittsburgh	12.50 to 13.00

No. 2 steel has brought offers of $3.25 for Pennsylvania shipment, but little tonnage has come out. Prices are easy on most grades and shipments are light. An inquiry for No. 1 steel for export at $7 is tentative with little interest. For textile $5.10 has been bid, shipping point, and $4.60 has been offered for heavy breakable cast.

New York—Scrap shipments have declined even from the recent low rate of buying, several eastern Pennsylvania mills having held up shipments. Prices on several grades are inclined to waver. One dealer is reported to have turned down $7.50 shipping point on No. 1 cast. No. 1 steel is being bought at $5.50 for shipment to Buffalo next season.

Philadelphia — The market is quiet with No. 2 melting down to $6.50 to $7, delivered. The lower price was done on a small lot. Bethlehem Steel Co. purchased approximately 800 tons No. 1 steel at $7.25, delivered, Sparrows Point.

Buffalo—Bethlehem is reported to have purchased a fair amount of No. 1 heavy melting steel for delivery at Lackawanna at its new low price of $8.50.

Pittsburgh—Offerings of iron and steel scrap continue limited and little surplus material is available at present prices. The December list of the Pennsylvania railroad includes only 18,000 net tons of various grades. Small lot sales of heavy melting steel continue to be made at $10.25 and $10.50, leaving the market unchanged at $10.00 to $10.50. Quotations on other grades are steady although heavy cast is slightly stronger on a sale at $8.75.

Cleveland—Additional instructions against further shipments of all grades of iron and steel scrap to Youngstown district consumers have been received by Cleveland dealers. Three important valley concerns now are embraced in this latest embargo, presumably brought on by slackening works activities as well as the approach of the December inventory. Meanwhile Cleveland consumers are taking in little material. Borings and mixed turnings have weakened 50 cents a ton.

Detroit—A firm tendency is noted in open-hearth grades of scrap, sheet clippings advancing 25 cents per ton on demand by dealers for making into bundles. Blast furnace grades have dropped 25 cents because lake movement is at an end.

Cincinnati—Conditions in iron and steel scrap continue without change, with most dealers acting conservatively until a definite trend is shown. Quotations are unchanged and nominal. Supply of some grades is meager.

Birmingham, Ala.—Heavier producers of scrap are not inclined to sell but dealers have sufficient to meet present demand. Prices remain low and weak.

St. Louis—Sentiment in iron and and steel scrap has brightened considerably during the past week. There are intimations that melters may purchase during December and that October and November mark the bottom. The vanguard of buying came in the form of the purchase of 5000 tons of steel by a leading east side interest, the first large tonnage taken in a number of months. This was reported to have been at the lowest figures paid in recent years.

Toronto, Ont.—Iron and steel scrap is without special feature. Sales showed a slight gain for the week as several consumers were out of stock and forced to renew their supply for immediate needs. Steel scrap is practically at a standstill and the improvement was entirely due to a better demand for iron grades. Dealers are still out of the market with price lists unchanged.

Canadian Scrap

Dealers' Buying Prices

Per Gross Ton

MONTREAL

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Canadian Steel Output Off

Toronto, Ont.—Canadian output of steel ingots and castings in October was 30,936 tons, against 33,390 tons in September, 65,431 tons in October, 1930. For 10 months of 1931 output stands at 623,781 tons; a year ago, 883,902 tons.

Canadian production of ferroalloys in October was 1912 tons, and in 10 months 42,006 tons, compared with 59,877 tons in 10 months of 1930. Because only one furnace was in blast, no production figures for pig iron in October will be issued.

A patent was asked in 1831 for smelting with anthracite and hot blast.

Coke

More Consumers Contracting for 1932, but Market Is Slow—Prices Are Unchanged

COKE PRICES, PAGE 53

Pittsburgh—Beehive coke demand is slow to improve. Little change is noted in demand for foundry or furnace coke although better activity is expected for domestic fuel as a result of colder weather. Spot furnace coke continues $2.35 to $2.40, with foundry coke $3.25 to $4.50.

New York—Despite dull demand and the recent slight increase in production, standard grades of beehive coke have advanced to $3.25 to $3.50, Connellsville, although a careful buyer may still be able to obtain a little at the old minimum of $3. Premium brands of foundry coke are $4.50, Latrobe. Beehive furnace coke is unchanged at $2.25 to $2.50, Connellsville. By-product coke is $8.70 to $9.10, Newark, N. J., $10.50 New England; and $8.75, Philadelphia.

Cincinnati—A few contracts for by-product foundry coke have been closed for the first half. Quotations for that period are undetermined, but reports indicate no change from $9, delivered Cincinnati. Shipments show a fair increase over October.

Chicago—A large proportion of the regular buyers of by-product foundry coke have contracted for first half at $7.50, Chicago district ovens. Furnace stocks continue heavy. November shipments improved slightly.

St. Louis—The market is quiet, consumption of metallurgical coke continuing at a low ebb. Demand for other industrial purposes is sluggish. Unusually warm weather has checked domestic sales.

Birmingham, Ala. — Production now is about 50 per cent of normal. No business is being done for first half, but producers believe orders will pick up after the first of the year. Prices are steady.

Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 7.25c, Conn., for copper

Sheets	
Yellow brass (high)	13.00
Copper, hot rolled	16.12½
Lead, sheets, to jobbers	7.00
Zinc sheet (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	16.25
Seamless copper	15.62½
Rods	
Yellow brass (high, full turnings)	10.75
Naval brass	11.87½
Anodes	
Copper, untrimmed	12.62½
Wire	
Yellow brass (high)	13.00

Old Metals

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	3.75 to 4.00
Chicago	3.25 to 3.50
Cleveland	4.00 to 4.25
St. Louis	3.50
Heavy Yellow Brass	
New York	2.25 to 2.50
Heavy Copper and Wire	
New York	4.75 to 5.00
Boston	5.00 to 5.25
Chicago	4.00 to 4.25
Cleveland	4.00 to 4.50
St. Louis	3.75
Composition Brass Borings	
New York	3.50 to 3.75
Yellow Brass Tubing	
Cleveland	2.50 to 2.75
Light Copper	
New York	3.75 to 4.00
Chicago	3.25 to 3.50
Cleveland	3.50 to 3.75
St. Louis	3.50
Light Brass	
Boston	1.75 to 2.00
Chicago	1.75 to 2.00
Cleveland	1.75 to 2.00
St. Louis	2.00
Zinc	
New York	1.00 to 1.25
Cleveland	1.00 to 1.25
St. Louis	1.50
Aluminum	
Clippings, new, soft, Cleve.	11.00 to 11.50
Clippings, hard, Cleveland	8.00 to 9.00
Borings, Cleveland	3.00 to 3.25
Mixed cast, Cleveland	3.75 to 4.00
Mixed cast, Boston	3.25 to 3.50
Mixed cast, St. Louis	3.50 to 4.00

Secondary Metals

Remelt aluminum No. 12'	8.50 to 9.50
Brass ingots, 85-5-5-5	7.12½

Metals

Copper Stronger Following Agreement of Belgians to Curtail—Lead, Zinc Dull

New York—Agreement of Belgian copper producers to curtail production Friday brought a reversal in the copper market with quotations nominally up a quarter to a half cent. Other metals retained an easy tone last week with buying still in small volume.

Copper—Most custom smelters immediately withdrew from the market Friday on announcement of Belgian interests to curtail output in line with conversations in New York recently. Preceding the announcement, copper had been available from custom smelters at 6.25c, Connecticut, the lowest price in history. Producers other than custom smelters have been out of the market for a number of days but have been quoting a nominal figure of 6.75c, Connecticut. Little activity in copper is anticipated until definite announcement of curtailment plans is made and until it appears that quotations have been fairly well stabilized.

Tin—Straits tin has reflected closely trend of prices and activity in the London market. The decline in sterling exchange and weakness in silver has contributed to a declining tendency in tin, which was available Friday at 22.37½c, New York.

Zinc—Prices eased off slightly at the close of the week with prime western metal available at 3.12½c, East St. Louis, and 3.47½c, New York. This grade has been extremely quiet but some fair orders have been booked for high-grade metal. Statistically, zinc is in the strongest position of all metals.

Lead—Buyers showed only mild response to a cut of $2 a ton in lead early last week. Quotations appeared fairly steady at the lower quotation of 3.65c, East St. Louis, however.

Antimony—Quotations showed little or no change last week and domestic demand continued at the recent dull rate.

Aluminum — Buying still is in light volume and prices continue to hold. World producers outside the United States have formed a price-fixing corporation.

Silver — Quotations have again fallen below 30.00c an ounce on selling of speculative interests.

Distillates Firm; Contracting Is Slow

New York—Demand for toluol and other distillates is seasonally light, but equal to present output. Prices are firm and distributors are slow to quote for next year. Phenol demand is unchanged and prices are steady. Consumers interest in naphthalene for next season has increased, although contracting is slow. Stocks are being accumulated. Sulphate of ammonia is weak.

Coke By-Products

	Spot
Per Gallon, Producers' Plants, Tank Lots	
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants in	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.10 to $1.20

Quicksilver Firmer

New York—Quicksilver prices are firmer here, virgin flasks of 76 pounds being quoted $70 to $72. Little buying is being done, however. In the past few days prices have ranged from $72 down to $68.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot	Nickel Ingot
November 23	6.50	6.87½	6.25	22.87½	23.12½	3.85	3.65	3.15	22.90	6.65	35.00
November 24	6.50	6.87½	6.25	23.12½	23.45	3.85	3.65	3.15	22.90	6.62½	35.00
November 25	6.25	6.87½	6.00	22.75	23.00	3.85	3.65	3.12½	22.90	6.62½	35.00
November 26—Holiday											
November 27	6.25	6.87½	6.00	22.37½	22.70	3.85	3.65	3.12½	22.90	6.62½	35.00

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Pacific Coast

Seasonal Dullness Reigns and Small Lots Only Are Bought—Seattle Warehouses Increase Steel Prices—New Inquiry Is Light and Few Projects Being Closed—Bridge Bonds Lapse

San Francisco—*(By Air Mail)*—With the exception of two structural awards aggregating 1300 tons, sales of iron and steel products on the Pacific Coast this week were confined to lots of less than 100 tons. While sentiment apparently is improving little real business is in sight and it is thought that renewed activity will be delayed until after the first of the year.

Provisional contracts for 110,000 tons of steel for the Golden Gate bridge, let in July, have lapsed through failure of the California supreme court to pass on the legality of $6,000,000 bonds for that project. A limit of six months was placed by prospective bond buyers and the decision has been delayed further. Guarantee checks have been returned to the bond bidders. At least a month will pass before a decision, sale of bonds and placing of steel.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Merchant bar steel is in light demand and consumers are buying only for immediate requirements. Prices continue to hold around 2.05c, c.i.f. Due to the rainy season construction projects are developing slowly and few new inquiries for reinforcing steel bars are noted. An award is expected soon on 362 tons for a gymnasium for the University of California, Berkeley. The only new inquiry involves 113 tons for two bridges for the state in San Luis Obispo county. San Francisco and Los Angeles district prices on concrete bars remain unchanged at 2.60c and 2.50c, base, on carload lots respectively.

McClintic-Marshall Co. booked 300 tons for buildings for the Safeway Stores in Los Angeles and the Judson-Pacific Co. took 1000 tons of structurals for the men's gymnasium at the University of California, Berkeley. New inquiries include 325 tons of sheet steel piling for work in connection with the Third Street bridge, San Francisco, and 250 tons for a court house in Martinez, Calif., bids on which will be opened Dec. 18. Plans are being prepared for a cancer ward for a hospital in San Francisco, which will require 350 tons Bids for this structure will not be called for until the first of the year. Plain shapes are quoted, generally, at 2.05c, c.i.f.

No award has been made on 1800 tons of plates, for six water tanks for Long Beach, Calif., on which the Western Pipe & Steel Co. is low bidder. No change in quotations is noted, 1.85c to 1.95c, c.i.f. being general.

Other Finished Material

For the second consecutive week awards of cast iron pipe were confined to lots of less than 100 tons. The largest letting involved 90 tons for Alhambra, Calif., booked by the United States Pipe & Foundry Co., Oakland, Calif., will open bids Dec. 3 for 1037 tons of 2 to 8-inch pipe.

Movement of steel sheets is restricted to carload lots. Quotations on No. 10 blue annealed sheets continue unchanged at 2.33c, c.i.f. No. 24 hot-rolled annealed sheets hold at 2.88c and No. 24 galvanized sheets are general at 3.38c, c.i.f.

Dullness Is General

Seattle—Seasonal dullness is intensifying the general situation in the Pacific Northwest. Not many projects of importance, involving steel products, are up for figures. Those pending are federal or county jobs. Industrial demand remains dormant and while there is a more hopeful undertone, the trade expects no improvement until early 1932.

Wholesalers in the Seattle district this week placed in effect a new schedule on bars, plates and shapes, increasing prices $5 a ton. The new list is 2.25c in lots of over 500 pounds and 2.50c for orders of less than 500 pounds. This advance is believed to be justified and it is felt that it can be maintained. It provides a margin for handling and cartage charges for small tonnages. Portland jobbers have not adopted this advance as conditions in that territory are unstable and more competitive.

Bars, Plates and Shapes

No projects involving important tonnages of reinforcing bars are up for figure and little business is pending. Recent awards have been for less than car lots. Northwest Steel Rolling Mills booked 30 tons in two local jobs and Consolidated Supply Co., Spokane, 17 tons for a government inspection station at Metaline Falls, Wash. Tonnages pending include 100 tons for the Port Angeles, Wash., post office and 65 tons for a state bridge at Wenatchee, Wash., both bids in, also 90 tons for an irrigation canal job on the Owhyee project, Oregon, bids Dec. 23. Puget Sound navy yard will open bids Nov. 30 for a small lot of special steel bars.

There is little interest in plates and no prospect of immediate activity. Tacoma will open bids Nov. 23 for 3380 feet of 42-inch steel or reinforced water pipe, approximating 100 tons. Bids for a boiler for the state capital at Salem, Oreg., involving 40 tons, are under consideration.

Structural awards this week exceeded 400 tons but the two larger contracts were taken by Eastern firms. Minneapolis Steel & Machinery Co. will furnish and erect 140 tons for the Canyon Creek bridge, Idaho, while St. Anthony bridge, Idaho, 135 tons, has been sublet to the Virginia Bridge & Iron Co. Hofius Steel & Equipment Co., Seattle, has the contract to fabricate 85 tons for a machine shop addition at McNeil Island prison. Award for a crane in connection with the same project has been postponed. Isaacson Iron Works, Seattle, is furnishing 50 tons for the Marine hospital, Seattle. No important work is up for immediate attention. Mill prices of these items are unchanged.

Finished Materials Dull

There is little life in the wholesale jobbing trade. Buying is confined to actual needs and in small lots. Country stocks are low but there is no disposition to replenish even at present low prices. Sheets are slow, other items also inactive. Dealers anticipate no upturn until after the holidays.

Pipe In Slack Season

Practically all pipe requirements have been filled and recent business has been in small lots out of stock. Next year's specifications will not be out until late next month, when the market will show more promise.

Europe

Britain Awaits Emergency Tariff—Improvement Shown in Several Lines—Continent Dull

London—(*By Cable*)—Iron and steel markets in the British Isles are uncertain, awaiting decision on the forthcoming emergency tariff. Important tonnages of steel recently arriving in South Wales must be disposed of before domestic supplies will be needed. Galvanized sheets are weak but export orders are expanding. Tin plate is weak but hopeful signs of better sales are seen.

Coke prices have hardened following greater demand, and form a factor toward higher quotations on pig iron. In the Middlesbrough district pig iron stocks are decreasing under better demand.

Plate orders are improving, semifinished and structural steel marking time. China has placed an order for 60 steel freight cars with a builder at Birmingham.

From Brussels comes the report that conditions are dull and prices easier, with some British and Argentine orders received. Berlin reports British competition is stiff and European demand low but overseas markets improving. The Paris observer sees conditions generally deteriorating.

Belgian Markets See Some Bright Spots

Brussels—The position of the Belgian iron and steel market continues unsatisfactory, but one or two bright spots alleviate the pessimism of recent weeks; among these is the increase in prices of raw materials, particularly copper and wheat, which has started in America and gives hopes of a gradual increasing tendency of price levels.

During the past week there have been more orders for iron and steel products from South America and the Far East. On the other hand, British inquiries are becoming scarce, but important tonnages have been shipped across the Channel to be stocked by British importers in anticipation of a probable tariff, with the result that the ports of Antwerp and Ghent have been very active, and it has been difficult to obtain freight quotations for immediate sailings and freights have materially hardened.

Conference on Coal

An international conference is to be held in Geneva to study the situation of the coal markets. This conference will be attended by representatives from France, Belgium, Great Britain, Germany, Poland, Holland, and Czecho-Slovakia, and the question of coal exports will be one of the principal items on the agenda.

The pig iron market is calm. In semifinished steel prices are nominal. Six-inch blooms are quoted at 330 French francs ($12.85) f.o.b. Antwerp for export, 2-inch billets at 350 francs ($13.65) and sheet bars at 360 francs ($14.05). Merchant bars are quoted at 370 French francs ($14.45) and normal-size beams at 365 francs ($14.25), while British sizes are quoted at 370 francs ($14.45). Belgian works are seriously competing against the French on the Franco-Belgian frontier and the Atlantic seaboard. Belgian prices can compete, notwithstanding transport rates and the French tariff. The Belgian sheet mills have taken several orders in France.

Extend Wire Syndicate

At the end of October the international wire rod syndicate held a meeting at which it was decided to extend the life of this syndicate for a further period of five years, until the end of 1936. The French group asked for an increase of 60,000 tons in its quota, owing to the fact that Societe Metallurgique de Normandie and Trefileries du Havre have joined the syndicate. A new international syndicate also has been formed for the sale of wire products and is known as the I. V. E. company. The European steel entente has been provisionally extended until the end of the year, as the present situation in world markets is too uncertain to make any definite plans of reconstruction.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 26

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports	£ s d	Continental metric tons Channel or North Sea ports	£ s d	£ s d
PIG IRON					
Foundry, 2.50-3.00 Silicon	$10.62	2 18 6	$7.80 to $8.35	2 3 0 to 2 6 0	
Basic bessemer	10.16	2 16 0*	7.26 to 7.62	2 0 0 to 2 2 0	
Hematite, Phos. .03-.05	11.80	3 5 0			
SEMIFINISHED STEEL					
Billets	$19.51	5 7 6	$9.62 to $9.80	2 13 0 to 2 14 0	
Wire rods, No. 5 gage	30.86	8 10 0	18.15 to 19.06	5 0 0 to 5 5 0	
FINISHED STEEL					
Standard rails	$29.95	8 5 0	$21.33		5 17 6
Merchant bars	1.13c	7 0 0	.47c to .48c		2 19 0 to 3 0 0
Structural shapes	1.26c	7 15 0	.46c to .47c		2 18 0 to 2 19 0
Plates, †¼ in. or 5mm	1.34c	8 5 0	.56c to .57c		3 10 0 to 3 11 0
Sheets, black, 24 gage or 0.5 mm.	1.42c	8 15 0	1.20c to 1.22c		7 10 0 to 7 12 6
Sheets, gal., 24 gage, corr.	1.50c	9 5 0	1.29c to 1.30c		8 0 0 to 8 2 6
Bands and strips	1.54c	9 10 0	.60c		3 15 0
Plain wire, base	1.38c	8 10 0	.84c		5 5 0
Galvanized wire, base	1.78c	11 0 0	.99c		6 3 9
Wire nails, base	1.78c	11 0 0	.85c		5 6 3
Tin plate, box 108 lbs.	$2.59	0 14 3	$2.39		0 13 2‡

British ferromanganese £20 10s 6d ($74.51) delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($32.67) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Renten Marks
Fdy. pig iron, Si. 2.5	$10.62	2 18 6	$10.39	265(2)	$11.12	400	$18.53	78
Basic bessemer pig iron	10.16	2 16 0*			10.29	370	20.31	85.50
Furnace coke	2.00	0 11 0	5.68	145	5.14	185	5.08	21.40
Billets	19.51	5 7 6	16.46	420	14.04	505	26.25	110.50
Standard rails	1.34c	8 5 0	1.41c	785	1.57c	1,210	1.37c	127
Merchant bars	1.13c	7 0 0	.90c	500	.71c	545	1.38c	128
Structural shapes	1.42c	8 15 0	.99c	550	.70c	535	1.35c	125
Plates, †¼-in. or 5mm	1.46c	9 0 0	1.17c	650	.87c	670	1.67c	154.50
Sheets, black, 24 ga. or 0.5mm.	1.42c	8 15 0	1.84c	1,020	1.73c	1,330	2.75c	255
Sheets, galv., corr., 24 ga. or 0.5mm	1.54c	9 10 0	2.39c	1,325	1.95c	1,500	4.43c	410
Plain wire	1.38c	8 10 0	1.68c	935	1.95c	1,500	2.24c	207
Bands and strips	1.54c	9 10 0	1.13c	625	.92c	710	1.60c	148

*Basic. †British ship-plates, Continental bridge plates. ‡German.
British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

Machinery

THANKSGIVING holidays in many cases have been extended over the week-end, which is indicative that improvement in inquiry has not to any extent been reflected in improved volume of orders. Better sentiment is characterized by more optimistic feelings about prospects for 1932, though little is expected of December 1931. It may be significant that certain lists, which long have been dormant, are being presented again for refiguring. New designs may account for this, but common belief is that it is in expectation of downward revision in prices. Resistance to Russian pressure for extended credits is stiffening in some, but not all, cases.

New York—Sales of machine tools and other shop equipment are light, being in the majority of cases confined to scattered individual units. While amount of inquiry remains practically unchanged, improved sentiment still is evident. Volume of business is expected to remain down, at least for the balance of this year.

Dealers and builders agree that until definite improvement appears in the metalworking industry, not much can be expected of the machine tool industry. The potential replacement market is known to be large, but until existing equipment again is called upon to operate at somewhere near normal schedules, buyers are not apt to be actively seeking improved machines to cut costs.

Government business is holding up fairly well and some of the older inquiries are being refigured. Other prospective buyers in some cases appear to be reissuing lists in attempts to obtain lower quotations than prevailed in the original bids.

Russian business, although greatly curtailed, is by no means extinguished. It is reported that some machine tool builders now are accepting long term credits which call for no down payment with the order, the first payment being due in 18 months. No uniform policy as to Russian credits has prevailed among machine tool builders. That fact, coupled with the attitude of the United States government toward Soviet recognition and Soviet trade, undoubtedly has had an adverse influence with banks in the taking up of Russian notes.

It is understood that a movement now is on foot to have pressure brought to bear to prevent recent foreign loans being used as a basis for establishment of credits which will further European competition with American machine tool builders.

Worcester, Mass—New England machine tool markets continue to be spotty. Within a week Reed-Prentice Corp. has closed on a lathe for an interest in France. This company also has sold two lathes to schools in the United States. This last mentioned list in addition has developed some activity in demand for saws. Navy department continues to inquire for lathes but orders from that source do not keep pace with inquiry.

Recovery fails to show in the grinder business, wherein proportion of foreign to domestic business remains constant. Expectation that Russian interests again will be in the market for American made machines early in January, is being expressed freely. In the meantime manufacturers in this district are resisting Soviet demands for extended credits comparable to those under which they are reported to have placed much business in Europe lately.

Pittsburgh—Machine tool sales fail to keep pace with improvement in inquiry which has been evident during the past several weeks. In most cases orders are made up of miscellaneous single tools. While total volume is slightly above the year's low, awards still are discouragingly slow.

Railroads continue to be conspicuously absent from the machinery market and steel mill purchases involve more of special equipment than standard tools. A fair volume of work remains pending.

Cleveland—Thanksgiving holidays in many plants in this district have been extended over the week-end, making it difficult to obtain a clear picture of machine tool market conditions. This extended shutdown indicates, however, that no amount of pending business is being closed.

Local machinery builders have been actively working on lists issued from a Canadian automobile plant which is being retooled to parallel methods now being installed in the parent company on this side of the line.

Production of machine tools largely is confined to those for the automobile industry. Pressure is being brought to bear to get deliveries.

Chicago—Few of the recent requests for figures on machine tools have materialized into inquiries. Sales remain light, and prospects for the remainder of this year are not encouraging.

Studebaker Corp., South Bend, Ind., is expected to add to its recent purchase by some additional orders which probably will be placed in the Chicago district. Northern Pacific railroad is inquiring for a 4-foot radial drill. Expectations now are that action on an inquiry from a local steelworks, which has been pending for some time, will be postponed until after the first of the year.

Exports of Metalworking Machinery

	—October—		January through October	
	1931	1930	1931	1930
Engine lathes	6	37	455	987
Turret lathes	5	32	205	384
Other lathes	34	21	604	575
Vertical boring mills and chucking machines	3	17	212	283
Thread-cutting and automatic screw machines	13	39	216	592
Knee and column type milling machines	5	20	140	289
Other milling machines	14	31	418	620
Gear-cutting machines	7	4	363	342
Vertical drilling machines	6	18	291	435
Radial drilling machines	2	3	113	146
Other drilling machines	77	76	1529	1403
Planers and shapers	13	4	268	289
Surface grinding machines	4	3	145	164
External cylindrical grinding machines	28	20	355	466
Internal grinding machines	3	20	238	288
Tool grinding, cutter grinding, and universal grinding machines	47	82	692	1442
Pneumatic portable tools	596	1175	8422	16128
Chucks for machine tools	739	694	7989	19621

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

LYNN, MASS.—Commonwealth of Massachusetts, Metropolitan district commission, Boston, is preparing plans for a steel and concrete bridge over Saugus river, between Lynn and Revere, to cost $1,000,000. J. R. Worcester & Co., 79 Market street, Boston, are engineers.

WEBSTER, MASS.—Webster Mills, care American Woolen Co., Shawsheen, Mass., has awarded contracts for a 2-story addition to its plant, 54 x 55 feet, to Chester S. Patten, 638 Main street, Melrose, Mass., to cost $40,000. Boilers and equipment have not been bought.

New York

BROOKLYN—Eastern Bridge Iron & Steel Corp. has been incorporated with $10,000 capital, by L. J. Lifschitz, 1440 Broadway, New York.

NEW YORK—Boron Alloy Steel Corp. has been incorporated with 1000 shares common stock, by W. T. Van Alstyne, 31 Nassau street.

NEW YORK — Superior Fireproof Door & Sash Co., 1811 Carter avenue, is having sketches made for a 2-story plant 50 x 100 feet, to cost $40,000. H. Ginsberg, 205 East Forty-second street, is architect.

RAVENA—Porter Mfg. Co. has been incorporated with $50,000 capital to manufacture machinery, by G. G. Porter, Ravena, N. Y.

New Jersey

NEWARK—Metal Compounds Corp. has been incorporated with 100 shares common stock to produce metals and compounds, by David M. Litwin, Bradley Beach, N. J.

NEWARK — Kelley-Magus Engine Mfg. Co. has been incorporated to manufacture engines, with $125,000 capital and 1250 shares common stock, by Herman W. Brams, 951 Broadway, Newark.

Ohio

CLEVELAND—Dur-Vita Valve Inc. has been incorporated with 100 shares no par value, by A. J. Weaver, 1229 Terminal Tower building.

WEST LAFAYETTE—Moore Enameling Mfg. Co. plans 1-story plant adjoining present plant for manufacture of enameled kitchen utensils, to cost $50,000, doubling capacity.

Illinois

GRANITE CITY—Granite City Castings Co. has been organized to manufacture ferrous and nonferrous castings for the hobbing trade.

Southern States

WILMINGTON, DEL.—Model Incinerator Co. has been incorporated with 1000 shares common stock to manufacture incinerators and waste disposal equipment, by Corporation Fiscal Co., Wilmington.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids until Dec. 8 on schedule 6945 for one suspension corrugated furnace, Morrison type, for delivery at Seattle by Jan. 15.

ATLANTA, GA.—Power plant, boiler and engine rooms of the Warren Co., 905 Fair street, have been destroyed by fire and equipment damaged. Replacements will be made immediately.

AUGUSTA, GA.—Municipal canal commission plans establishment of a standby power plant containing a 10,000 kilowatt diesel engine-generator unit and auxiliary equipment. Burns & McDonnell Engineering Co., 400 Interstate building, Kansas City, Mo., engineer. (Noted Sept. 24.)

Missouri

ST. LOUIS—Kranz Auomotive Body Co., 3032 Gravois avenue, has let contract for a 1-story plant, 54 x 125 feet.

ST. LOUIS—Shampaine Aseptic Steel Furniture Co., Abe Shampaine president, recently incorporated (Noted Sept. 10), has leased a plant, is developing models and samples and will start manufacturing in December.

Oklahoma

TULSA—Oklahoma Natural Gas Co., Tulsa, is constructing a gas distribution system here, including compressing, measuring and reducing stations. B. L. Maulsby, chief engineer of operations, Tulsa, is in charge.

Texas

HOUSTON—Stewart Roofing & Sheet Metal Co. has been organized by Frank C. Stewart, 2614 Leeland avenue, to operate a sheet metal fabrication shop.

HOUSTON—Houston Aircraft Co. has been organized by Dewey Bonbrake, owner and manager, to manufacture and sell aircraft. Plant and office have been established at 3300 Louisiana street.

Nebraska

LINCOLN—Lincoln Mine Machine Corp. has been incorporated with $25,000 capital, by E. A. Willner, W. G. Abbott and W. R. Schoenleber.

Pacific Coast

BERKELEY, CALIF.—B. F. Sturtevant Co., 2530 Sixth street, preparing to build first unit of plant for manufacture of ventilating equipment, cost $500,000.

LOS ANGELES—Alabatross Steel Furniture Co. Ltd., 12411 Exposition boulevard, West Los Angeles, E. S. Gillette president, has expansion plan for enameling and assembling departments, costing $65,000.

LOS ANGELES—Booth Engineering Co. Ltd., W. K. Booth president, is doubling capacity by addition of 15,000 square feet floor space for larger output of packaging and vending machinery.

LOS ANGELES—Los Angeles Gas & Electric Corp., Addison B. Day vice president and general manager, announces expansion plan for early 1932 for its Seal Beach plant, to add 50 per cent to generating capacity, costing $3,500,000. Includes addition 117 x 168 feet, new turbogenerator over 50,000 horsepower capacity, transmission lines.

Dominion of Canada

CHATHAM, N. B.—W. & R. Walsh Ltd. will rebuild its burned woodworking shop and will require new equipment.

BOWMANVILLE, ONT.—Metalworkers Ltd. has been incorporated with 40,000 shares no par value to manufacture metal products, by George L. Hall, Bowmanville.

LONDON, ONT. — Public Utilities commission, E. V. Buchanan manager, proposes to build workshop, 2 stories, 50 x 120 feet, to cost $40,000, some contracts having been awarded.

MIMICO, ONT.—Tugg & Mason Ltd. has been incorporated with $40,000 capital to manufacture automotive motors and machinery, by Harry Tugg, Toronto.

MORRISBURG, ONT.—Town council plans repairs and additions to power plant, including some new equipment. Fred Chalmers is clerk.

PRESTON, ONT.—Preston Lumber Yard will rebuild its burned plant, installing new machinery and electric motors.

TORONTO, ONT.—J. H. Lock & Sons have been incorporated with $20,000 capital and 20,000 shares no par value to manufacture refrigerators and ice machines, by George H. Gilday, Toronto.

LACHINE, QUE.—Prolac Ltd., formerly Asbestos Mfg. Co. Ltd., plans to install new equipment costing $100,000 in its plant here, for manufacture of asbestos products. Jacques Paradis is manager.